

The Milbank Memorial Fund
QUARTERLY

CONTENTS

	<i>Page</i>
THE INTERNATIONAL APPRAISAL OF LOCAL HEALTH PROGRAMS <i>C.E. A. Winslow, Dr. P. H.</i>	3
HEALTH INDICES <i>K. Stouman and I. S. Falk</i>	5
MORTALITY IN TUBERCULIN-POSITIVE INFANTS <i>Miriam Brailey, M.D., Dr. P. H.</i>	37
TRENDS IN ANNUAL BIRTH RATES AMONG MARRIED WOMEN IN SELECTED AREAS ACCORDING TO NATIVITY, AGE, AND SOCIAL CLASS <i>Clyde V. Kiser</i>	48
URBAN DIFFERENTIAL FERTILITY DURING THE DEPRESSION <i>Helen C. Griffin and G. St.J. Perrott</i>	75
ANNOTATIONS	90
Epidemiology and the Control of Syphilis <i>Ralph E. Wheeler, M. D.</i>	
Tuberculosis Among Native Races <i>Jean Downes</i>	
Report on Maternal Morbidity and Mortality in Scotland <i>Carroll E. Palmer, M. D.</i>	
Nutrition Problems in a Relief Population <i>Dorothy G. Wiehl</i>	

Vol. XV

JANUARY, 1937

No. 1

Edited by the Technical Staff

Published quarterly by the MILBANK MEMORIAL FUND, 40 Wall Street,
 New York, New York. Printed in the U. S. A. Subscription: \$1.00 a year

TH
OF

IN
A

Estab
depe
ficat
subs
has
reas
rura
mar
pare
as v
actu

M
mig
bro
obst
nati
"sta
vior
if o

Arg
T
this
ban
Des
the
C
clin
by
mer

'A
'J

Hygiene & P. H.,
3-30-37
33333

THE INTERNATIONAL APPRAISAL OF LOCAL HEALTH PROGRAMS

by C.-E. A. WINSLOW, DR. P. H.

IN the fall of 1935 the Committee on Administrative Practice of the American Public Health Association celebrated its fifteenth birthday. Established to collect data in regard to the current practice of health departments, to discover the best procedures, and to promote the simplification and standardization of such practice, this committee has made substantial contributions in this important field of community service. It has developed a technique for health surveys and thereby obtained a reasonably clear picture of American health practice in both urban and rural areas; it has crystallized the best elements of such practice in a manual of adequate community health organization; and it has prepared appraisal forms which are now generally accepted in this country as valid instruments for the objective and quantitative measurement of actual attainment as an aid in building a balanced program.¹

Many of us have long felt that the principles involved in this program might have useful applications in other countries and the subject was brought to the attention of English sanitarians as early as 1926.² The obstacles in the way of the application of such a program on an international scale were, however, considerable. American tendencies toward "standardization" were under some suspicion; and it was, indeed, obvious that some procedure much more flexible than ours must be devised if one desired to compare the health programs of such countries as the Argentine, Denmark, England, and Roumania.

The Health Section of the League of Nations began serious study of this problem some two years ago and with the cooperation of the Milbank Memorial Fund and able leadership from Dr. Knud Stouman of Denmark and Dr. I. S. Falk of the United States has brought it far along the road to solution.

One of the major psychological obstacles in the path to progress was eliminated by replacing the American term "appraisal form standards" by the more tactful phrase "sanitary indices." This was, however, no mere trick of phraseology. In the American forms we first obtain an

¹*American Journal of Public Health*, December, 1935, 25, No. 12, pp. 1296-1320.

²*Journal of the Royal Sanitary Institute*, 47, No. 2, 1926, pp. 133-151.

objective measure of a given activity (for example, in a given city, 1,000 visits to clinics for every 100 deaths from tuberculosis); we then state that the ideal ratio is 1,500 visits; and we allow 10 points on an appraisal score for the attainment of this ideal. The Geneva "sanitary index" calls for the objective measure of actual accomplishment but omits the ideal standard and the score. This was an act of true statesmanship, essential to success on an international basis. The record of accomplishment is the essential thing. Each country can establish its own standards if it desires; and in any case a comparison of performance in various localities establishes an automatic self-standardization which gives all the impulse toward progress which is necessary. This is an excellent example of the Geneva technique which selects what is generally useful in a given procedure and frees it from the adventitious elements of national psychology.

A second departure of the Geneva program from our own is equally significant. American appraisal has been concerned solely with administrative practices in accordance with our habit of considering the health program as a delimited area of sanitary and medical activity. European nations (and to some extent South American nations as well) have been ahead of us in recognizing that public health is a social science, intimately related to a multitude of factors influencing the physical and mental and social well-being of the community. It was decided therefore to include in the sanitary indices not only administrative practices but also measures of such factors as housing, nutrition, literacy, education, recreation, social security, and the like.

After continued preliminary work by Dr. Stouman and Dr. Falk at Geneva, Dr. Stouman came over to this country and spent some months, in consultation with American workers, in completing a schedule of sanitary indices under the three main headings of Indices of Vitality and Health (vital statistics), Indices of Environment (climatic, social, and economic factors) and Indices of Administrative Activity. From this schedule of 161 items with detailed subclassifications, from an abridged schedule of 100 items, or from a short list of sixty items, it should be possible to gain a clear picture of the health problems, the health resources, and the health attainments of any given community.

To illustrate the procedures involved, Dr. Stouman has applied the complete schedule to the City of New Haven, Connecticut, and in connection with the schedule itself, which has just been published in the *Quarterly Bulletin of the Health Organisation of the League of Nations*,

the full results of the New Haven survey are presented to illustrate the application of the new technique.

The work of Dr. Stouman and Dr. Falk in the selection and arrangement of their sanitary indices has been done with admirable skill and discretion. It seems to the writer probable that the preparation of this schedule will take its place as an outstanding landmark in the history of public health. If American experience offers any precedent, the application of the sanitary indices should prove of immeasurable value in stimulating in many countries the development of public health practice along sound and fruitful lines. For us, too, the new concepts introduced in the Geneva plan have great significance and will no doubt modify profoundly the spirit and content of our own appraisal forms. The whole enterprise represents an ideal type of international cooperation for which public health workers everywhere owe a deep debt to all concerned.

HEALTH INDICES¹

A STUDY OF OBJECTIVE INDICES OF HEALTH IN RELATION TO ENVIRONMENT AND SANITATION

by K. STOUMAN AND I. S. FALK

I. GENERAL CONSIDERATIONS

THE purpose of public health statistics may be said to be three-fold. They should enable us to: (1) Measure the state of health of a community in all its aspects; (2) Appraise the activities undertaken for protection of the community health; and (3) Obtain indications concerning the relationship between the state of health and environmental factors, whether natural, social, or resulting from specific health measures.

The first point has hitherto received much the largest share of attention. Beginning with statistics of births and deaths more

¹ The complete manuscript of this report, including the accompanying schedules and the findings of a trial application of the indices in New Haven, Connecticut, is being published in the December issue of the *Quarterly Bulletin of the Health Organisation of the League of Nations*. Because of space limitations only the text of the main report will be published in the *Quarterly*, although the Fund purposes later making available a limited supply of the complete monograph for distribution in the United States.

than a century ago, this type of information has slowly spread to statistics of causes of death and of the prevalence of epidemic diseases, tuberculosis, venereal and occupational diseases. In recent years, the general morbidity statistics have received considerable attention, the approach having been partly through general sickness surveys and partly by analysis of the records of national health insurance systems. This development has largely been due to a growing interest in the problem of medical care and to an increasing recognition of the fact that mortality statistics alone are insufficient as indices of the state of public health.

Information concerning public health activities has long been available in the annual reports of national and local health departments and in the reports of special inquiries. It is largely of a heterogeneous nature, however, and no general attempt has been made to systematize it or to determine exactly what elements are really wanted and which are lacking. The only practical and elaborate contributions to the solution of this problem are the Appraisal Forms prepared and utilized by the Committee on Administrative Practice of the American Public Health Association. These forms were prepared with American conditions in view and cannot be applied in unaltered form to conditions obtaining elsewhere in the world. They are also meant rather for periodic surveys than for current publication.

Knowledge concerning relationships between factors of environment or sanitary measures and the state of public health is largely confined to areas which have been specially studied. This must, to a certain extent, always be so; it is generally possible to approach the question of ultimate causal relationships with any high degree of scientific exactitude only in studies of limited scope. This limitation, which to a large extent depreciates the practical value of public health statistics, is due, in the first instance, to the fact that precise information is not available, or at least is not readily accessible, concerning many of the important factors known to influence the state

of health. Such factors are notably housing, nutrition, social, economic, and cultural conditions.

The solution of these problems does not present exactly the same features in different countries. It seems, nevertheless, that much could be gained by devising from the beginning a comprehensive plan for health indices which could be followed, as far as local conditions permit, in at least a number of countries. The problem of international coordination and comparability will therefore arise at an early stage in a study of a system of health indices.

The Health Organization of the League of Nations already has contributed in the past to the development and publication of health statistics. The current epidemiological reports of the Health Section constitute in themselves a valuable contribution, and the special studies of infant mortality and the preparation of handbooks describing the organization of vital statistics in various countries have, in several respects, widened the scope of statistical procedures. Expert Commissions of the Health Organization have examined problems arising from the classification of joint causes of death and from the definition of stillbirths, as well as from the development of general morbidity statistics.

It was therefore a logical development of previous activities when the Health Organization decided to inquire into the possibilities of a further extension of public health statistics in the form of health indices. It obtained in this study the valuable collaboration of the Milbank Memorial Fund of New York, which had already accumulated considerable experience in collateral fields and notably in regard to sickness surveys and the problems of medical care. The Milbank Memorial Fund also generously provided financial support for the technical execution of this inquiry.

The study was commenced in Geneva in 1935 under the supervision of the Medical Director, Dr. L. Rajchman, but it was decided to transfer it to the United States in order to reap the fullest benefit from the large experience acquired in that country in regard to

health surveys. The work has been carried out principally at the Yale School of Medicine, New Haven, Connecticut, and the authors are particularly indebted to the valuable suggestions and the constant help and encouragement so generously given by Professor C.-E. A. Winslow, chairman of the Department of Public Health at the Yale School of Medicine and for fifteen years chairman of the Committee on Administrative Practice of the American Public Health Association.

Valued advice has also been received from other members of this Committee and notably from Dr. W. F. Walker, of the Commonwealth Fund (formerly Field Director for the Committee), and from Dr. George T. Palmer, of the New York City Department of Health. Professor Ira V. Hiscock and Dr. J. H. Watkins, of the Yale School of Medicine, have collaborated very generously in the preparation and experimental application of the plan.

The present plan is designed to facilitate the accumulation and presentation of information relating to public health and to elements of environment believed to influence it. The plan is not to be considered as a final system applicable in all its parts to all countries; it is, first of all, an attempt to establish a classification of data which are deemed desirable in order to arrive at a more complete and a more precise appreciation of health conditions than is now ordinarily obtained. While all of the information included in this plan is not available in any one locality, it all exists in one locality or another in such form that it has been or could be utilized. The importance of bringing together in one place, in systematic arrangement, pertinent information which is now published by many different public services, or which is not published at all, has been uppermost in the minds of the authors.

It is fully realised that much of the information called for in this plan is now utterly lacking in international, or frequently even in interurban, comparability. This is evidently the case, for example, in regard to the records of school medical examinations, which are

frequently not comparable even between two different examiners in the same town. Experience shows, however, that comparability of statistics has rarely, if ever, been obtained before there was a definite demand for it. Rather than omit from the beginning all data which are not yet satisfactory, the authors have hoped, by including them and utilizing them for what they are worth, to create a demand for their improvement and for international definitions and standards which lead to the development of comparability. Wherever possible, checks have been devised to facilitate evaluation of the data.

It should be emphasized that no sound system of health indices can be rigidly permanent in its form. It must grow and develop with the evolution of the community and must be adaptable to the changing problems which present themselves for solution. The element of continuity necessary to reap the full benefits offered by statistical records can best be safeguarded by a logically conceived plan sufficiently comprehensive to assure that proper weight is given to all factors relevant to the public health. The lack of continuity from which many records suffer is mainly due to the fact that the rôle of public health statistics has never been thought out as a whole but has been conceived piecemeal as need or occasion arose. We have here attempted to pose the entire question at once. What information ought we to have in order to evaluate the state of the public health and the factors which affect it, and how can this information be arranged in a logical and concise form?

The term *Health Indices*, which is due to the Medical Director of the Health Section, has been chosen, not only because it covers more than numerical indications, but also because it implies a reasoned selection from the unwieldy mass of available statistics of such elements as are most characteristic and descriptive of a given situation. No attempt has been made to devise a single health index by which the general state of public health of a community could be rated. It is the opinion of the authors that such unit rating would

have only slight practical interest and might serve as much to obscure as to measure the individuality of local problems. The present system is not meant to appraise these but to indicate, describe, and measure them.

When only general indications are desired, it will not be found necessary to employ the long list of Health Indices and to undertake the considerable statistical compilation which they require. Short lists have been devised which include all the indices believed to be necessary in order to indicate the fields in which the peculiar problems of a given community are mainly to be found. Once this has been done, sections of the long list corresponding to problems requiring special attention may be chosen for further elaboration. They may even, if needed, be worked out in greater detail than shown in Annex 1.

In following this reasoning the authors have no intention of underestimating the value of the standards of administrative practice or of the rating scores employed in the American Appraisal Form or to question the procedure followed in the City and Rural Health Conservation Contests conducted by the United States Chamber of Commerce. These contests have stimulated community interest in public health in the United States. It would not, as a rule, be possible, however, to make such direct comparisons between one country and another where conditions of life, natural environment, and administrative procedure may be widely different. Not merely would the American scoring procedure be misleading as a measure of public health accomplishment, but standards of requirement in any given field should naturally vary with the magnitude and characteristics of local problems. Common standards cannot be applied indiscriminately to highly diverse areas. In one country, malaria control may be the most urgent problem, while in another this disease may never have been present. Similarly, the procedure of tuberculosis control cannot be quite the same in countries or localities where final success is in sight as in

those where the campaign against this disease is in its beginnings. Financial resources for health purposes are not unlimited, and it may be justifiable in one community to neglect a problem which is important in another, in order to concentrate available funds on the most urgent needs.

In abandoning, in the system of health indices, the standards, the scores, and the weighting of these scores which play an important part in the American Appraisal Forms, greater flexibility is obtained. Nothing is said as to what problems should be considered the most important nor as to what standards should be attained in the various fields. The indices are therefore merely what they were meant to be in the first place: a means of measuring community health and factors which may influence it. Comparison in point of time and from one locality to another will permit an appreciation of the significance of any one of the indices without expressing any opinion as to when a given performance or accomplishment should be considered satisfactory. It is obvious that the value of the system will increase with the opportunities of comparison afforded by its wide and current use. Such comparison will become more direct, more precise, and more useful concurrently with improvement in the national and international comparability of the data. The proposed health indices will not, therefore, give a full result immediately upon adoption of the system; they will constitute essentially a flexible and dynamic system adaptable to changing health conditions and capable of attaining considerable precision and utility progressively as they are tested, refined, and standardized. Yet, lest that which should remain fluid and adjustable might become fixed and rigid, the Health Indices should be subjected to periodic critical reviews.

2. HISTORICAL OBSERVATIONS

The first effective surveys of health conditions were performed nearly a century ago. Edwin Chadwick's report on "Sanitary Con-

dition of the Labouring Population of Great Britain (1842)" and Lemuel Shattuck's "Report of the Sanitary Commission of Massachusetts (1850)" have become classics. These reports, however, do not attempt to establish a system of indices capable of appraising at the same time health conditions and public health practice.

The first attempt to elaborate a complete system of appraisal of health conditions together with administrative activity was made some sixty years ago. It was conceived in the United States and was examined in a committee of the American Public Health Association. Credit for this most interesting and valuable work, from which inspiration may still be drawn in certain fields, belongs to the chairman of this committee, John S. Billings, M.D., surgeon of the United States Army and founder of the famous United States Army Medical Library.

Dr. Billings says in his covering letter, dated Washington, D. C., August 25th, 1875:

These questions are intended to obtain, as far as possible, the information which would be desired in estimating the healthfulness of a given place, and to ascertain the local and especially the preventable causes of disease at that point. Facts and not opinions are desired, and the questions are drawn up in that point of view.

The list of the chapters gives a very interesting indication of the elements which Dr. Billings considered important in an appreciation of public health conditions. They show on several points a wider conception of public health activity than that which has usually prevailed up to recent times.

Chapters of Dr. Billings' Schedule (1875)

- A. Location, Population, and Climate
- B. Topography and Geology
- C. Water Supply
- D. Drainage and Sewerage
- E. Streets and Public Grounds
- F. Habitations

- g. Gas and Lighting
- h. Garbage and Excreta
- i. Markets
- j. Slaughter-Houses and Abattoirs
- k. Manufactories and Trades
- l. Public School Buildings
- m. Hospitals and Public Charities
- n. Police and Prisons
- o. Fire Establishments, Alarms, Engines, etc.
- p. Cemeteries and Burial
- q. Public Health Laws, Regulations, Officials-Municipal
- r. Registration and Statistics of Disease
- s. Quarantine

A handwritten note on the manuscript suggests in addition:

- t. Consumption and Sale of Liquor and its Effect on Health and on Crime

Each chapter includes from twelve to forty-four questions which are concise and to the point so as to call for a precise and objective reply. The schedule was published in Baltimore in 1878 as an extract from a lecture delivered before The Johns Hopkins University.

It is truly remarkable that Dr. Billings should have recognized and emphasized sixty years ago the influence upon public health of urbanism, housing, and overcrowding which, in his own country, are not yet viewed as matters of public concern in relation to health. There are questions as to the employment of women and children in factories and diseases due to working conditions. In the chapter on schools, questions are asked, not merely regarding sanitation of the premises, but in regard to playgrounds, indoor and outdoor physical exercise, and the result of medical examinations and tests of vision.

It is readily understandable that health officers should have thrown up their hands in despair when they saw this long list of questions. The conception of the questionnaire was undoubtedly much ahead of its time and the more so as officials had not yet be-

come accustomed to surveys; but it is regrettable, nevertheless, that it should have received such scant attention in subsequent years on the part of those who were responsible for the organization of security against disease.

No new development of any importance occurred in this field until Dr. Charles V. Chapin, the health officer of Providence, Rhode Island, undertook in 1915 to make a comparative analysis of the activity of state health departments. Dr. Chapin's work, which was published by the American Medical Association, showed that a quantitative evaluation of health work could be made. This study was of decisive importance in awakening interest for the appraisal idea. It should be noted that the purpose of Dr. Chapin was much narrower than that of Dr. Billings and this well-defined restriction of scope is typical of Dr. Chapin's sense for realities, which always enabled him to carve out from his large vision of ultimate objectives to be attained those which can be immediately realized. He devised a "rating sheet" containing only thirty-six items which he considered essential. We here meet for the first time the idea of a short list of typical "indices," which was later to be discussed by Dr. Philip S. Platt, as distinct from a full list covering all elements to be appraised. This problem has not yet been fully solved, because the establishment of a short list must grow out of experience with a full list of subjects.

No further action followed for several years, and the health appraisal idea was kept alive largely by Dr. Lee K. Frankel and Dr. Louis I. Dublin, of the Metropolitan Life Insurance Company. It was clear, however, that this task could be undertaken only by a body representative of American public health opinion. This body was created by the appointment in 1920 of the Committee on Administrative Practice of the American Public Health Association. Professor C.-E. A. Winslow was appointed chairman and has, in this position during the following fifteen years, accomplished the tremendous task of devising indices and standards for the appraisal

of public health activities in the United States and of developing the appraisal technique. He was ably seconded in this work by Dr. Chapin, Dr. Haven Emerson, Dr. Dublin, Dr. W. S. Rankin, Dr. W. F. Walker, and many other leading public health men. The success which has attended this work is to a large extent due to excellent team work in this group of distinguished workers.

The work of the Committee on Administrative Practice is well summarized in a symposium by Dr. Dublin, Dr. Winslow, and Dr. John L. Rice, Commissioner of Health of the City of New York, presented to the annual meeting of the American Public Health Association in 1935. In 1923, the Committee completed a survey of health practice in the eighty-three largest cities of the United States, which was published by the United States Public Health Service. Based upon this and other work, a first comprehensive Appraisal Form for experimental use was prepared and, in August 1924, approved by a representative committee of city health officers. After a year's experimental field work, a revision was made and a new and definitive edition published in January 1926. It was provided that periodical revisions should be undertaken, in order to keep the form abreast with the development of public health thought and practice, and a Sub-Committee on Revision was appointed. New revised editions were published in 1929 and 1934.

In the meantime, work had begun on a Rural Appraisal Form, a tentative draft of which was first published in 1927. A second and final edition of this form was published in 1932, after a large amount of experimental field work. Studies are now being carried out for a new revision of this form, which seem likely to result in extensive changes.

The abridged forms used in the City and Rural Health Conservation Contests in the United States are a development of the Appraisal Forms, although they do not altogether cover the same facts. The first of the city contests was held in 1929, the first of the rural contests in 1934. In 1936, 234 cities and 160 rural counties

participated in these competitions for distinction in respect to their public health practices and accomplishments.

The purpose of the American Appraisal Form is, according to its authors, definitely limited: "first to assist the health officer in planning his program and in evaluating the activity of the various units of his organization; second, to provide a simple and clear-cut picture of the achievements and the needs of his organization." Elsewhere, the introductory statement says: "The score attained by a city does not pretend to measure its 'healthfulness'. 'Healthfulness' can be measured by no single or simple method. It is reflected only incompletely, for instance, by mortality rates, the most readily available measure. Mortality rates are influenced by many factors: the economic, industrial, cultural, and educational status and the nativity stock of the inhabitants; the age distribution of the population; the geographic location, and climatic environment; as well as the actual community measures that are carried out to conserve health."

Such limitation of scope is legitimate and even desirable in order to produce a concise picture, so long as none of the elements essential to assure the desired evaluation is omitted. This depends to a certain extent, although not altogether, upon the conception of the rôle of the health services. This conception is not the same in all countries nor at all times.

There is a fundamental reason why the plan of "Health Indices" here proposed differs considerably from the American Appraisal Form. The new system is not meant primarily to evaluate the activities of the health department but to measure, so far as feasible, the "healthfulness" of a given community. Many features of the two forms will nevertheless remain similar and comparable. It is only fair to acknowledge that it would hardly have been possible to prepare a workable list of health indices without the wealth of experience previously accumulated by the preparation and use of the American Appraisal Forms.

The American Appraisal Form for City Health Work is divided into four main divisions and thirteen sections. The Rural Form differs only slightly from this pattern in its general construction. The divisions and sections are:

- I. *Common Services:*
 - A. Vital Statistics
 - B. Laboratory
- II. *Preventable Disease Activities:*
 - A. Acute Communicable Diseases
 - B. Venereal Diseases
 - C. Tuberculosis
 - D. Other Disease Activities (not scored)
 - E. Mental Hygiene (not scored)
- III. *Activities for the Promotion of Hygiene of the Individual:*
 - A. Maternity Hygiene
 - B. (1) Infant Hygiene
(2) Preschool Hygiene
 - C. School Hygiene
- IV. *Sanitation Activities:*
 - A. General Sanitation
 - B. Food and Milk

The classification is seen to be rather by objectives than by services, the visiting nursing activities, for example, being distributed under the various subject headings.

It should be noted that the form does not touch on curative medicine except in respect of tuberculosis, venereal disease, and infant hygiene clinics. Hospitals are not covered by the form nor is industrial hygiene except for a general question as to whether or not the health department takes any cognizance of this subject. Problems of housing and nutrition are not mentioned. The primary reason for these omissions seems to be that these subjects are not, as a rule, dealt with by the health departments in the United States.

The classification used in the forms for the Health Conservation Contests is possibly less theoretical and covers certain subjects not

included in the Appraisal Form, such as method of sewage disposal, dental care, periodic health examinations, life loss statistics, auto deaths, and budget. Its main divisions are:

- i. Water Supply
- ii. Sewage Disposal
- iii. Protection of Milk Supply
- iv. Preventive Measures
- v. Community Interest and Education
- vi. Life Loss Statistics
- vii. Financial Support for Local Health Work

Other appraisal forms for health work have been inspired by these forms. Amongst them may be mentioned the "Appraisal Form for Industrial Health Service," prepared in 1932 by Dr. Leverett D. Bristol, health director of the American Telephone and Telegraph Company.

Appraisal forms have been developed in other and allied fields, such as "The Community Score Card" prepared by the Federal Council of Citizenship Training and published in Washington, D. C., in 1924 by the Bureau of Education. A score card entitled "Community Measurement Standards" was prepared in 1925 by the Wisconsin Conference of Social Work in 1925. The "Standard Schedule for grading cities and towns of the United States with reference to their fire defences and physical conditions" first adopted in 1916 by the National Board of Underwriters is also worth mentioning as it covers not merely the fire department but also water supply, climatic conditions, building regulations, and structural conditions of buildings.

The appraisal of public health and social work in the United States in the twentieth century has been dominated by the ideas of the scoring of activities and of using these presumably objective scores as guides and stimuli toward improvement of service. The basic purpose in these undertakings has been less that of scientific investigation of relationship between the state of health, the en-

vironment and the work performed, than of stimulating competition in fields already selected as full of promise.

This development is not a direct continuation of the original idea of Dr. Billings, which was to establish a series of indices showing the state of public health and of the conditions influencing health. He had evidently in mind rather to collect material upon which planning could be based than to organize a contest.

There is no intention in these lines to minimize the utility of friendly competition in these or in any other fields. It should be remembered, nevertheless, that the purpose of statistics is not merely to establish a chronological record of past happenings or performances. Statistics are essentially a compendium of research, a general headquarters activity upon which the planning of future activities is to be based.

It is interesting to know that the leaders in the Appraisal Form movement in America with whom the authors have been in contact have expressed themselves as in hearty accord with the broadening of the scope and the elimination of rigidity in the program we are here presenting.

The present study is an attempt to prepare a system of indices which will measure, not merely (1) the performance of the health department and allied organizations, but also (2) the actual state of health and vitality of the population, and (3) the conditions of natural and artificial environment which may influence health and vitality. The indices are meant for local, national, and international use.

The American Appraisal Forms use *indices*, *standards*, and *scores*. The indices are the basic descriptive data or rates. The standards are generally the indices (or derivatives from the indices) actually attained by the upper quartile of the previously appraised communities. The scores are arbitrary values assigned to each type of health activity according to the accepted professional opinion as to its relative importance. A full score is given for an activity

when it reaches or exceeds the prescribed standard, a partial score for a performance which is lower but still creditable. The total of these scores, after appropriate and agreed weighting, forms the score of performance of all the health activities.

In the present study, the system of standards and scores has been abandoned; a single set of standards could not be applied to countries where conditions and administrative practice differ widely, and if no common standards can be set, no scoring is possible. If the setting-up of standards for comparable areas should be found desirable, this could be done, at any rate, only when sufficient experience had accumulated. As it is, the indices alone are retained. They are simply indices of facts which may be utilized for guidance and comparison as occasion demands and by suitable methods.

3. COMPOSITION OF THE HEALTH INDICES

Any system of indices devised to furnish precise and objective information on the state of public health and the factors which influence it must cover a very wide field. It cannot be limited to subjects and activities for which only the health department is responsible. If, in the future, it should become desirable to widen the scope of official public health work, its proper administrative expression will be found in due time. In the meantime, there can be no objection to the pooling and collective analysis of information concerning any conditions or activities which may have a bearing upon the public health, just as there have been no objections to the publication of extracts of all national statistics in statistical handbooks.

A growing tendency to widen the scope of public health conceptions has been clearly evident in European countries for several years. At present, a similar tendency is rapidly gaining ground in the United States. The questions of adequate medical care, especially for the part of the population which, for lack of sufficient resources, does not always obtain it, is at present one of the most

important problems under discussion. A solution of this problem has been attempted in most European countries—and in many of them with a substantial degree of success—by the institution of national health insurance and public medical provisions. There may be other or intermediate solutions which might be better adapted to American conditions, but the problem is clearly on the order of the day. Information, not merely regarding mortality and contagious diseases, but also concerning the prevalence of disease in general and as to what care the sick are now receiving, is therefore urgently needed.

Adequate housing accommodation is essential to healthy living, and interest in this problem is rapidly growing in the public health profession. In Europe, the housing problem is officially recognized as being of national concern by the governments of an increasing number of countries. This evolution has occurred without distinction of political tendencies, governments of so different fundamental conceptions as those of Great Britain and of Italy having taken the lead in this direction. It is obvious, at any rate, that no complete picture of the background of public health can be drawn without reference to the housing situation.

Our knowledge of the elements of nutrition has been greatly enriched in recent years, but next to nothing has been done to bring this knowledge effectively and practically to that part of the population which, on account of its limited resources, needs it most. The attachment of trained nutritionists to the visiting nursing services has been inaugurated with success in some of the model services of the United States, such as New Haven, Connecticut. It is clear that information is badly wanted in order to establish the influence of this factor. So far, adequate statistics on the consumption of the various articles of food are available only in Italy, but an expressed demand for them must be created if they are to become available.

These are the outstanding *new* problems with which the public

health profession is now concerned, but there are many others, notably in the fields of industrial hygiene, mental hygiene, physical examination, and physical education. Even the accident problem—whether industrial, traffic, or general—is one of direct and frequently growing concern to public health.

This widening scope of the conception of public health—from control of specific diseases to responsibility for the protection and betterment of individual life and health in general—involves the collection and analysis of a vastly increased amount of information. In order that this information should not become too unwieldy, it is desirable that: (1) it should be logically classified; (2) the most essential and characteristic parts of it should be extracted from the mass of specialized reports; and (3) such information should be currently published in one place, so as to allow a convenient appreciation of the health situation as a whole. This is what the present system of health indices proposes to do.

The difficulties to overcome are very serious, and there is no precedent to follow, except insofar as administrative practice in the narrower field of public health is concerned. The proposed plan must, therefore, be regarded as experimental. The arrangement of many items will undoubtedly prove unsatisfactory and will have to be improved. But the experimental stage cannot be hurdled. It may be recalled that the establishment of the American Appraisal Form, which is much more limited in scope than the system contemplated, has required several years of work and experimentation on the part of a large number of the most experienced men of the American public health profession before it became a really effective tool. A beginning must be made with some system; it must first be used experimentally in several localities and thereafter be revised by a competent committee, perhaps subsequently assisted by competent subcommittees of experts in specific fields.

It is proposed to divide the system of health indices into three main divisions:

- A. Indices of Vitality and Health
- B. Indices of Environment
- C. Indices of Administrative Activity

The first part includes the Health Indices proper. The second covers the natural or artificial background of the health situation, and the third shows what is being done to ameliorate the one and the other.

4. INDICES OF VITALITY AND HEALTH

The main chapters of this first division comprise the following:

- I. Population
- II. Natality
- III. Stillbirths, Infant and Maternal Mortality
- IV. General Mortality and Causes of Death
- V. Morbidity
- VI. Invalidity
- VII. Insanity and Mental Defects
- VIII. Alcoholism and Drug Habit
- IX. Accidents
- X. Suicides and Homicides
- XI. Examinations of Physical Fitness

These chapters cover the indices on the vitality and health of the population which generally are or readily could become available. The elements which are actually available will naturally vary considerably from one country or city to another, and a completely answered survey form is only a goal to be gradually attained. Inasmuch as no scoring or total rating is contemplated, the contents of one chapter will not be invalidated if that of another should be incomplete.

A-I. Population. The chapter on population should include the elements which are characteristic for, or have a direct bearing upon, its vitality and health; its size and growth, natural and by migration; the sex and age distribution; the proportion of women of child-bearing age, married or not; the size of families; and, wherever

necessary (as in the United States), the nativity and racial distribution.

It is essential, in the case of a city, that the growth of the population should be shown separately for the city and its suburban area. The rapid spread of the city population into suburban areas, chiefly owing to the increasing use of the automobile, has for the last twenty years been one of the chief characteristics of urban development in practically all parts of the world. It is essential to know how this movement responds to changing economic conditions and how it affects the health of the population. Difficulties arise as to the definition of suburban areas, which at present are left largely to the judgment of local authorities. It will be necessary to have this question examined some day by an international group of experts, which may seize the occasion also to consider the question of the definition of urban and rural areas. It is probable that, in the end, the element of growth itself must be included in the definition, so that the suburban area comes to cover all the surrounding territory in which there is a marked swelling of the population owing to the proximity of the town. This would give moving limits, however, and it may be found necessary to introduce a system of zoning, using the density and not the administrative area as a basis. The proportion of rural farm population may also be a useful index. Until such work has been carried out, there is probably no other way out of the difficulty than to use the local definitions, which on the whole, will be based upon actual knowledge as to where people who work in town, or are intimately connected with its economic life, live.

It is desirable, in general, that these indices should not become too unwieldy, and the classifications must therefore be fairly short and simple. The annual statistical reports of the various departments can always be examined when greater detail is wanted. The age distribution used throughout the plan is therefore as short as is both possible and practical: under 5 (except for infant mortality),

5-14, 15-24, 25-44, 45-64, and 65 and over. These groups correspond roughly to preschool and school ages, youth, early and late working ages, and old age. Each of these groups has characteristics of its own in respect to mortality, causes of death, morbidity, and conditions of life.

Statistics of size of family are also very useful in an evaluation of living conditions and as a complement to natality data, but standard definitions are wanted also here. It is necessary to know whether all living children or only those being at home are counted, whether all offspring or only minor children are included, and where adopted children, orphans, or children of dissolved marriages are counted. A solution of this problem, however, is less complicated and probably also less urgent than the one mentioned previously.

The data in the chapter on population will come largely from census returns. Other sources of information should not be overlooked, however, notably in regard to intercensal estimates of urban and suburban population, which, when based entirely upon decennial returns, have proved to be over 10 per cent off in many towns, thus falsifying all rates. Among auxiliary sources of information on the movement of the population should be mentioned population registers, school censuses, lists of voters, directories, telephone, electricity and gas company returns, none of which may be quite exact and complete, but may nevertheless furnish valuable indication as to current trends in the population. Whenever such estimates are used, the source should be given together with a comparison with census returns.

These indices are not sufficient for a complete population study, but they do show at a glance those demographic characteristics of the locality which have a direct bearing upon community health and growth.

A-II. *Natality.* Statistics of natality are equally necessary in order to show with what kind of population we are dealing. A low-birth-

rate population conveys in itself an image quite different from that of a high birth rate population. What this image stands for cannot be expressed definitely in figures, but we know that it means something quite tangible in the mode of life and in cultural and social conceptions.

Apart from this, natality has a very direct bearing upon the vitality of the community. It is not only an important element in population growth, but is also to a certain extent related to the infant mortality and the prevalence of certain communicable diseases of early childhood.

The principal indices which should be included in this chapter are: live birth rate; fertility rate of women, married and single, 15-44 years of age; reproduction rate (gross or net, as may be feasible). If necessary, certain of these rates may be given by race, color, or other important divisions. Marriage statistics may be included, although they are not always of great value.

All birth statistics, as well as all other statistics, should be fully corrected for residence. Birth rates for towns not so corrected are useless and should be discarded.

A-III. *Stillbirths, Infant and Maternal Mortality.* Stillbirths are dealt with together with infant mortality because they are antenatal deaths and, as such, closely related to the neonatal mortality. It is true that stillbirth records are frequently not complete. They may nevertheless be considered as fairly reliable now in a considerable number of countries, and the principal obstacle for direct comparison is the variation in the lower limit which separates them from nonreportable abortions. This question can be solved, and has been dealt with in the definition proposed in 1925 by the Expert Committee on Stillbirths of the Health Section. A further attempt to have this definition more widely adopted might be useful. Differences in the upper limit (whether a birth is a live or a stillbirth) might be eliminated, when necessary, by combining for the purpose the stillbirth rate with the neonatal mortality (under 1

month) to give a rate of "birth mortality." This rate is widely employed in Italian vital statistics and is of particular interest in connection with studies of the results of prenatal care and of the organization of obstetrical services.

Earlier and later infant mortality (1-11 months) must be kept strictly separated because their nature is largely different. This should be done also for the causes of infant mortality—injury at birth, prematurity, congenital debility, and malformations being typical for the neonatal infant mortality; respiratory and intestinal infections for the later infant mortality. The inclusion of a few causes of stillbirths may be warranted in certain localities but not in all.

Statistics of abortions are occasionally available from the prenatal nursing records, but can be employed only with due reference to the month of pregnancy when treatment began.

Maternal mortality is dealt with in this chapter because it is closely connected with prenatal and obstetrical care. Deaths from abortions should be kept separate from deaths in childbed, and the principal causes of maternal mortality should be specified. Whenever feasible, it might be well to give the maternal mortality according to attendance at birth, but it must be borne in mind that the most difficult cases are apt to end in hospitals. Classification should therefore preferably be made according to who was first in charge of the case.

A-IV. *General Mortality and Causes of Death.* Crude and standardized death rates of the town and its suburban area are included in the plan of Health Indices, but neither can replace the specific death rates by age and sex, as only these will indicate how the population responds to its surroundings at the various stages of life. Unfavorable conditions in youth or early working ages, where mortality is always relatively low, may thus easily be obscured in the general death rate, whether standardized or not, by a comparatively low infant or old age mortality. Each age of life presents its

peculiar problems, and specific death rates give a first valuable indication of the direction in which additional efforts for the improvement of health are particularly needed.

Death rates for the major causes must also be given by sex and age, for the same reason. Moreover, the age of death from a given cause has a significance of its own. It is more or less natural, for example, that many old people should die from heart failure, but it is very serious when death from this cause takes an increasing toll in the prime of life. The list of causes of death have been limited in the Health Indices, as far as possible, to those which constitute serious problems of health and concerning the incidence of which better information cannot be obtained from other sources. The incidence of such notifiable epidemic diseases as no longer cause an appreciable mortality are better treated in the chapter on morbidity.

A-V. Morbidity. Up to the present, we have been chiefly concerned with current census and vital statistics; the new element has been more in the selection and arrangement of data than in the provision of information not currently used. With morbidity statistics we enter the field of statistics which have not generally been currently used in the evaluation of the state of public health. These statistics are almost always less complete than the mortality returns. In many countries and cities, parts of the morbidity data are now complete enough, however, to take their place in a general descriptive system. The reporting of most epidemic diseases, and even of tuberculosis, is certainly now, in many localities, as good as or better than the certification of most causes of death was in the Nineteenth Century, when there was usually no other source of information available concerning the prevalence of disease. The same may be said of the records of certain diseases compiled by many health insurance services.

The chapter on morbidity includes case rates and case-mortality rates for the more important epidemic diseases; the reported case

rates for syphilis and gonorrhœa, if possible by sex, age, and marital condition; the reported case rates for tuberculosis, preferably by sex, age, and type; the incidence of tuberculosis cases carried on the register; cases of occupational diseases notified; general morbidity data by cause, from health insurance records wherever possible, if not eventually from community sickness surveys; sickness returns and the results of medical examination of school children, wherever available.

Venereal disease returns are approximately complete only in very few countries and in a certain number of cities and other localities elsewhere. Attempts have frequently been made to keep a check upon the reporting of practising physicians, however, and a fair knowledge exists of the extent to which the records can be trusted. They constitute, on the whole, a valuable source of information concerning the prevalence of these very important diseases.

The tuberculosis registers have in recent years been handled very efficiently in many countries and localities, and ultimate checking against the deaths is always possible. These data are therefore entitled to a prominent place in any system of health indices where they will be accompanied by the necessary ratios of control. With the prolongation of life and the saving of many tuberculous patients, mortality records can no longer be considered to measure adequately the prevalence of tuberculosis nor even its trend at a given moment. The deaths are now chiefly those of old cases. There will naturally be an increase both of new cases reported and of those already on the register until the records are well established, but, thereafter, efficient tuberculosis control should result in a decrease in new cases. There should, at the same time, be an increase in the number of cases on the register, especially when compared with the new cases, on account of the extension of life of the patients. This ratio has been introduced in the present system of health indices and deserves closer examination.

Tuberculosis cases should be reported by sex, age, and type, be-

cause the evolution of the disease and of its public health aspects vary accordingly. It is essential to keep cases of the hilum or childhood type apart. Information, which is not now generally available, should be sought as to the proportion of respiratory cases which were in the initial stage when reported.

Adequate tuberculosis registers now exist in a large number of localities of many countries, but it seems desirable, before making international comparisons, to obtain a standard definition as to what cases should be on the register. In some countries, only "open" cases are counted. This does not seem to be a safe procedure, the more so as a large number of advanced and really not arrested cases now become "closed," thanks to the various forms of collapse therapy. It would be desirable also, from a prophylactic point of view, to include indices as to the extent to which collapse therapy is used.

Silicosis is probably the most important occupational disease—at any rate, it is undoubtedly deserving of this invidious distinction when considered in terms of its repercussions upon public health in general. Case reporting is probably much less reliable than that of the various industrial poisonings, but an effort must be made to obtain more complete information regarding the incidence of this condition. The case rate in exposed occupations should therefore be included, even if the data are incomplete.

Other information regarding the incidence of specified diseases may be shown in the Health Indices wherever warranted, such as the typing of pneumonia cases, spleen measurements in malarial regions, etc.

The huge amount of information on morbidity available in the records of national health insurance services generally has not so far received the attention which it merits. The best morbidity returns from this source published in annual form are probably those of Scotland and of Czechoslovakia, where such reports are already rendering a substantial service. A further analysis by geo-

graphical and social divisions will render them still more useful. When utilizing such returns as Health Indices, it is not sufficient to give the number of cases; the number of days of incapacitating illness due to each disease must also be taken into consideration. The significance of any of these rates must be duly weighed against the type of medical care given, the classes of the population covered, the situation of dependents in the insurance scheme, the benefits guaranteed, the waiting period, and similar factors which vary greatly from one system to another. It is important also to know whether members are dropped from the lists or are maintained by contributions paid in their behalf when they can no longer pay their contribution themselves.

Practically nothing has been done so far with the records of disease among school children as distinct from the current medical examinations. It is important, however, that better information regarding the prevalence of disease in childhood be obtained, and questions to this effect have therefore been included in the Indices.

The principal findings of the school medical examinations have also been included in the Indices, but careful research into the possibilities of establishing international standards and definitions for the various pathological conditions must be undertaken before these data will have any real comparative value. It should not be too difficult to reach an agreement on standards for defects of vision and hearing, but it will prove much more difficult to deal with morbid throat conditions. For example, the medical appreciation of the needs for tonsillectomy, according to recent studies in New York, seems so far to be not much more than guesswork. These difficulties should not discourage attempts in this direction. The study of physical defects conducted among school children in New York City under the direction of Dr. George T. Palmer, and published in 1934 under the title "Physical Defects: The Pathway to Their Correction," shows the value of this material when properly prepared. Hospital statistics may, under certain circumstances, be

of some value, but it is necessary to keep in mind that they are always much influenced by the adequacy of available facilities and by the conditions of payment for service.

Apart from the current records for the common epidemic diseases, the various categories of morbidity data here mentioned are not published in the vital statistics reports, but are scattered over many reports, if they are published at all. The Health Indices will therefore render a service by bringing them together in one place.

A-VI. Invalidity. The incidence of invalidity (defined as a permanent or prolonged total or partial incapacity to work) is an important element in the measurement of community health. Complete and reliable information is available only where a system of compulsory invalidity insurance exists, or where special surveys have been made; but, even so, it must be accompanied by specification of the scope of the insurance and the definition of cases covered by it. It must usually be supplemented by the invalidity cases coming under the Workmen's Compensation Act.

Disease and accidents contribute by far the largest share to invalidity, but blindness and other physical defects are also of importance. Information regarding such cases can, in some countries, be obtained from census returns. Even where this is not the case, there will frequently be information available from various sources concerning the blind. It is preferable, wherever possible, to give the data on blindness and other invalidity by broad age groups in order to separate the cases which are due to mere old age infirmity from the others.

A-VII. Insanity and Mental Defects. It is usually difficult to obtain precise information regarding the prevalence of mental disease, because the number of sick interned in asylums and those known and otherwise cared for depends largely upon the policy pursued and the facilities available. These difficulties are even greater in the case of mentally abnormal children than for adults. For cities or other local areas of administration, an additional difficulty fre-

quently arises from the fact that institutions for the mentally deficient and for the insane usually serve a much larger territory than that of any local government area.

The problem of mental disease, nevertheless, cannot be disregarded in an appraisal of the health and vitality of the population, and such data as are available must be included in the Health Indices for what they are worth. They comprise notably returns of insane asylums, institutions for mentally defective children, behavior clinics and other outpatient services, and, in some countries, certain information from the census returns.

Only experience can show which data are the most significant and the most apt to be made comparable by setting up the necessary standards and definitions. It may prove preferable to select as indices for adults certain well-defined mental diseases which may furnish more definite numerical indications than the total figures. The incidence of general paralysis of the insane has a definite public health interest of its own, and it should be possible to obtain fairly accurate information about it. This entire field is comparatively unexplored, and, if the Health Indices in the beginning should serve merely to stimulate interest in the organization of new research, the inclusion of this item would be largely justified.

A-VIII. *Alcoholism and Drug Habit.* Alcoholism cannot be disregarded in a stocktaking of community health, although statistical evidence concerning its prevalence and effects has always been among the most debated subjects. Most of the statistical material will be in the form of evidence of effects rather than direct indices of the actual abuse of alcohol. Even so, such records may be useful in determining with some degree of certainty the upward or downward trend of the evil. Such indices are the number of persons treated for alcoholism or sentenced for offences committed in the state of inebriety. The first group of evidence relates to extreme conditions of chronic abuse, while the second is apt to throw light upon the extension of drunkenness in general, whether habitual

or occasional. The latter is probably the most important of the evils, but the incidence will naturally depend to a large extent upon the attitude of the police and the judicial authorities and upon their efforts to trace any evidence of drunkenness. Whatever information can be obtained must therefore be utilized with all necessary precautions.

Information concerning drug habits will usually be limited to the internment and treatment of addicts, the number of which covers only a small fraction of those who are affected. Such figures may, however, at times, furnish useful indications regarding its trend.

A.-IX. *Accidents.* Accidents may, for purposes of control and other administrative action, be divided into three large groups: occupational accidents, traffic accidents, and other more occasional accidents. All represent substantial menaces to life and health against which definite action can and should be taken. Statistics of nonfatal bodily injury can usually be obtained regarding the first two categories; only statistics of death are usually available in respect to the third.

Workmen's compensation insurance covers, in nearly all countries, the occupational accident risk, and full details of cases are as a rule obtainable. Such data are usually classified by duration of incapacity for work and give, therefore, a substantial picture of the magnitude of the problem.

Traffic accidents have increased enormously during the last twenty years and have therefore attracted much attention in view of the establishment of improved systems of traffic regulation and other means of reduction. Complete statistics are now usually available, notably concerning automobile accidents, to which are assigned all accidents in which motor vehicles were involved. Rates should be given, not merely on the basis of population, but also per 1,000 motor vehicles registered, which is usually the best index of density of traffic. This may not be the case, however, in rural communities with crossings of important highways on their terri-

tory. It is preferable to classify accidents according to place of occurrence and only in secondary classification by residence of the victim. The rate of automobile accidents is an indispensable element in a system of health indices, because a community cannot be said to offer an adequate guarantee to life and health so long as its rate of traffic accidents is unduly high.

A-X. *Suicides and Homicides*. The suicide rate is an important index of nervous strain in relation to nervous adaptation and resistance. The rates should be given, if possible, by large age groups and, at any rate, by sex, because considerable changes have occurred within comparatively recent years in the age and sex distribution. It is frequently seen that the rates for certain groups increase while others decrease, indicating a shifting of the strain from one class to another.

When the homicide rate is given, it should be made clear whether it includes nonwillful manslaughter, as in case of accident due to gross negligence. Such cases should, so far as possible, be excluded, so that homicide is taken to mean intentional killing and death from intentionally inflicted injury.

A-XI. *Examinations for Physical Fitness*. Measures for physical fitness should, at any rate theoretically, be an important element in a system of health indices. Perfect health does not mean merely the absence of incapacitating illness—which is only the final breakdown of a physique unable to resist general or specific conditions of its environment. So far, little is available which can furnish objective measures of the physical fitness of the population.

Medical examinations of school children have been dealt with under "Morbidity," where they properly belong, because they do not yet go much beyond the detection of certain morbid conditions.

A number of physical examinations of adults are carried out by life insurance companies and among employees of various industrial or commercial concerns. The findings are generally not available in detail, if at all, and the groups examined cannot as a rule be

considered as typical for the population at large. More valuable information can be obtained, in certain countries, from the physical examinations for military conscription. They are often influenced, however, by consideration of whether the number of recruits really wanted represents a high or a low proportion of the young men available. Even when such data are obtainable in adequate form it should be remembered that deductions cannot be drawn from them as to the physical conditions of men at middle life or of women. Only when such information becomes more abundantly available will it be possible to determine whether the lengthening of the span of life is partly due to a betterment of physical fitness or merely to a decreased incidence of disease.

The chapter on physical fitness will, therefore, at present, be more an indication of an essential factor not to be lost from sight than a real index of the vitality of the population as a whole.

(To be continued)

MORTALITY IN TUBERCULIN-POSITIVE INFANTS¹

by MIRIAM BRAILEY, M.D., DR.P.H.²

THE material for this note is derived from the experience of the special outpatient clinic for childhood tuberculosis which has been in operation under the direction of Dr. E. A. Park at the Harriet Lane Home of the Johns Hopkins Hospital since 1928. Admissions to the special clinic are limited to infants who, before two years of age, are shown to be either infected with tuberculosis as demonstrated by a positive tuberculin test, or who are in imminent risk of infection because of familial contact with sputum-positive tuberculosis. After the patient has been registered in the clinic, supervision and study are continued as long as possible, but as the clinic was established only in 1928, not many of these patients have been under observation more than five years.

This study deals with the record, up to November 1, 1934, of the patients registered in the clinic during the five-year period from November 1, 1928, to November 1, 1933. From the total registration of 358 have been selected all those who had a positive tuberculin test prior to two years of age, an X-ray of the chest taken at the time of the test, and had remained under observation at least one year subsequent to this test unless dying sooner. The third condition excluded five patients otherwise eligible, four of the families having refused cooperation and the other having removed from the City after seven months. Patients fulfilling all three conditions totaled 170,³ of whom seventy-two were white and ninety-eight were colored.

¹ Reprinted with the permission of the author and publisher from the *Bulletin of the Johns Hopkins Hospital*, July, 1936, lix, No. 1, pp. 1-10.

² From the Department of Epidemiology of the Johns Hopkins University School of Hygiene and Public Health, and the Department of Pediatrics of the Johns Hopkins Hospital. Grateful acknowledgment is made of the assistance of Dr. W. H. Frost, Professor of Epidemiology, who directed the compilation and analysis of data from clinical records. The study was aided by grants from the Milbank Memorial Fund, the Commonwealth Fund, and the Maryland Tuberculosis Association.

³ Twelve of these children were already known to the Harriet Lane as infected infants
(Continued on page 38)

Time-Period in Months After First X-Ray	Number Under Observa- tion at the Beginning of the Time-Period	Number Withdrawn Alive From Observa- tion During Period ¹	Number Dying During Time-Period	Average Number Under Observation for Computing Mortality	Percentage Dying During the Time- Period	Percentage Surviving During the Time- Period	Percentage Surviving Through Period and Current Time- Period	Percentage Dying Dur- ing Preceding and Current Time-Periods
x	l_x	w_x	d_x	$l_x - \frac{w_x}{2}$	$100q_x$	$100p_x$	$100P_x$	$100(1-P_x)$
WHITE								
0-6	72	0	5	72.0	6.9	93.1	93.1	6.9
6-12	67	0	2	67.0	3.0	97.0	90.3	9.7
0-12	72	0	7	72.0	9.7	90.3	90.3	9.7
12-24	65	16	0	57.0	—	100.0	90.3	9.7
24-36	49	12	0	43.0	—	100.0	90.3	9.7
36-48	37	6	0	34.0	—	100.0	90.3	9.7
48-60	31	9	1	26.5	3.8	96.2	86.9	13.1
COLORED								
0-6	98	0	14	98.0	14.3	85.7	85.7	14.3
6-12	84	0	7	84.0	8.3	91.7	78.6	21.4
0-12	98	0	21	98.0	21.4	78.6	78.6	21.4
12-24	77	24	2	65.0	3.1	96.9	76.2	23.8
24-36	51	16	2	43.0	4.6	95.4	72.6	27.4
36-48	33	5	0	30.5	—	100.0	72.6	27.4
48-60	28	16	1	20.0	5.0	95.0	69.0	31.0

¹Period of observation less than five years because of registration in clinic subsequent to November 1, 1929.

Table 1. Total observed life experience and mortality following first X-ray in 170 children infected with tuberculosis before two years of age.

On November 1, 1934, when these records were compiled, all of the 170 children in the group had been on the clinic register as tuberculin-positive for at least one year; hence the rate of mortality during the first year following the discovery of infection may be

prior to November 1, 1928, when they were transferred to the clinic. Three of the twelve, although less than two years of age when found to be infected, were more than two years old when the special clinic opened. On November 1, 1928, their ages were respectively 24 months, 29 months, and 44 months. For these twelve patients observation has been dated from the discovery of infection rather than from the date of registration in the special clinic.

expressed very simply by stating the number of deaths within the first year as a percentage of the whole number registered (Table 1). To express accurately the rate of mortality for a longer period—say five years—it is necessary to take into account the fact that the numbers available for calculation are necessarily diminished as time is extended, since many of the children included came into the clinic considerably less than five years prior to November 1, 1934. Therefore, the computation must be made step by step, following conventional actuarial procedures as shown in Table 1. Obviously the numbers under observation are much too small to yield stable rates of mortality in each single year. However, the rates indicated for the first year under observation and for the whole five-year period have a fairly definite significance.

Table 2 shows in summary, as derived from Table 1, the mortality for white and colored children separately, in the first six months; the second six months; the entire first year; the next four years; and for the five-year period following the discovery of infection. It should be borne in mind that all children of the series were less than two years old when found to be tuberculin-positive, the average age for each race at the time of the first⁴ positive tuberculin test being thirteen months.

Table 2. Mortality during various periods after discovery of infection in 72 white and 98 colored children found to be tuberculin-positive before two years of age.

INTERVAL IN MONTHS FROM DISCOVERY OF POSITIVE TUBERCULIN	NUMBER OF DEATHS		MORTALITY PER CENT DURING INTERVAL	
	White	Colored	White	Colored
0-6	5	14	6.9	14.3
6-12	2	7	3.0	8.3
0-12	7	21	9.7	21.4
12-60	1	5	3.4	9.6
0-60	8	26	13.1	31.0

⁴ Very rarely could the time of infection be more accurately dated by preceding negative tests.

In both races the mortality within the first six months after the discovery of infection is approximately twice as great as in the second six months; and within the first year as a whole it is approximately two and one-half times greater than in the whole of the next four years. About 70 per cent of the mortality for the entire five-year period occurs during the first year of observation.

With reference to Table 2, it is to be noted that, at every time interval shown, the colored children suffered a mortality more than twice that suffered by white children. Within the first year of observation the mortality was about 10 per cent in white children and 21 per cent in colored children, and for the whole five-year period it was 13 per cent for white and 31 per cent for colored children. Stated conversely, these observations indicate that the chance of survival through five years subsequent to infection discovered before two years of age was 87 per cent for the white and 69 per cent for colored children.

When the 170 patients are classified according to X-ray findings at the first examination, sixty-seven of them showed definite lesions in the parenchyma of the lung, usually accompanied by enlarged tracheo-bronchial nodes. About one-third of these (twenty-two) were actually ill when first seen and presented fairly conclusive evidence of pulmonary tuberculosis apart from X-ray findings. In the remaining forty-five who were brought for observation and not because of illness, ordinary physical examination was negative, and the diagnosis could not have been made without the use of tuberculin and X-rays.

There were 103 children whose initial X-rays showed no definite involvement of the lung parenchyma. Of these, thirty-six showed enlargement of the mediastinal shadow with definite bulging of the tracheo-bronchial nodes; while sixty-seven showed no definitely abnormal shadows at first X-ray, and were therefore designated as roentgenologically negative on admission.

The mortality in these three classes of patients during the first

year of observation and during the whole five-year period is shown in Table 3. In group A of the table, of sixty-seven children showing unquestioned pulmonary involvement when first X-rayed, twenty-one were dead within the first year, a rate of 31 per cent, while three additional deaths (two of which were not attributable to tuberculosis) occurred during the next four years, raising the five-year rate to 40 per cent. It is to be noted that the rates for white and colored, once parenchymal lesion was found to be present, were practically identical.

If we select from group A the twenty-two patients who were ill with tuberculosis when first examined and whose lesions were sufficiently far-advanced to produce physical signs, the extremely high first-year mortality of 68 per cent was found; and this rose to 82 per cent for the entire five-year period. The mortality for such extensive disease was the same for children of both races.

Table 3. Mortality in 170 tuberculin-positive infants during (1) the first year, and (2) the five years following discovery of infection: according to lesion shown at initial X-ray.

FINDINGS ON FIRST EXAMINATION	RACE	NUMBER OF CASES	DEATHS			
			Within One Year		Within Five Years	
			Number	Per Cent	Number	Per Cent
A. Parenchymal Lesion	W	23	7	30.4	8*	38.6
	C	44	14	31.8	16*	40.5
	Total	67	21	31.3	24**	40.0
B. Bulging Tracheo-bronchial Nodes	W	18	0	—	0	—
	C	18	2	11.1	4*	25.3
	Total	36	2	5.6	4*	12.7
C. Negative Chest X-rays	W	31	0	—	0	—
	C	36	5**	13.9	6**	17.3
	Total	67	5**	7.5	6**	9.2
B and C Combined	W	49	0	—	0	—
	C	54	7**	13.0	10***	21.3
	Total	103	7**	6.8	10***	11.1

*Indicates 1 death from nontuberculous cause, there being a total of five in five years.

Of the twenty-four deaths which occurred during the five-year period of observation in group A of Table 3, twenty-two were due to tuberculosis. The immediate cause of death in eleven of the twenty-two was tuberculous meningitis, while generalized tuberculosis brought about death in six others. The five remaining patients were thought to have merely extensive pulmonary lesions, but in three of these upon whom a postmortem examination was performed, an unsuspected miliary tuberculosis was found to be present. It is clear that extrapulmonary involvement was responsible for at least 75 per cent of the tuberculous deaths.

Referring to children of group B and C as shown in Table 3, there were 103 of these patients who displayed no parenchymal lesion at initial X-ray; they were either X-ray-negative when first seen, or they showed only enlarged tracheo-bronchial nodes on first examination. Their combined mortality for the first year of observation was 6.8 per cent, and for all five years 11.1 per cent. These rates are roughly one-fourth those for children coming under observation with parenchymal lesion and followed during the same time-periods.

The observations show no significant difference in total mortality between children admitted with bulging nodes (B) and those admitted as X-ray-negative (C).

However, mortality in the two races in children admitted without parenchymal lesion is significantly different. Among fifty-four

Table 4. Classification of initial chest findings in 170 tuberculin-positive infants, white and colored.

FINDINGS ON FIRST EXAMINATION	WHITE		COLORED	
	Number of Cases	Per Cent	Number of Cases	Per Cent
Parenchymal Lesion	23	31.9	44	44.9
No Parenchymal Lesion	49	68.1	54	55.1
TOTAL	72	100.0	98	100.0

colored children seven deaths occurred during the first year of observation, a rate of 13 per cent. This rate increased to 21 per cent by the end of five years of observation. During the same five-year period of time, no deaths occurred among forty-nine white children.

Of the ten deaths occurring among these fifty-four colored children during the five years of observation, seven were attributable to tuberculosis, five falling in the first year of observation and two somewhat later. One child died of miliary tuberculosis without meningitis. Tuberculous meningitis was the immediate cause of death in the remaining six. In two of the six the meningeal involvement was preceded by miliary tuberculosis. The remaining four of the six meningeal patients were thought, during life, to have no parenchymal lesion, but in three who underwent postmortem examination, well-defined pulmonary lesions were discovered. All the deaths due to tuberculosis in children admitted without parenchymal lesion were due to extrapulmonary involvement.

The higher mortality observed in the colored children of this series appears to be attributable to their greater tendency to develop parenchymal lesion. This is shown partially by the results of the initial X-ray examination, at which 45 per cent of the colored and 32 per cent of the white infants showed pulmonary involvement. It is still further shown by the greater frequency in colored children of subsequent development of parenchymal lesions in those who showed none when first admitted, as is seen in Table 5.

In this table are included only those children who, on first examination, showed no parenchymal lesion and for whom there was at least one subsequent X-ray. For the first year subsequent to admission parenchymal lesions developed at the rate of 2.1 per cent in the white and 24 per cent in the colored children. For the five-year period subsequent to admission, as nearly as can be estimated from the scant data available, the indicated proportions developing parenchymal lesions are 5.8 per cent in white and 28 per cent in colored infants.

RACE	NUMBER OF CASES	PARENCHYMAL LESIONS			
		Within First Year		Within Five Years	
		Number	Per Cent	Number	Per Cent
White	48	1	2.1	2	5.8
Colored	54	12	24.0	13	28.0
TOTAL	102	13	13.4	15	17.2

Table 5. Rate of development of parenchymal involvement during (1) the first year and (2) the five years subsequent to discovery of infection in 102 infants showing no parenchymal involvement at first X-ray, white and colored.

It is thus evident that in this series colored children infected with tuberculosis developed parenchymal lesion much more frequently than did the white, but once such lesion had developed, the risk of death was not materially different in the two races.

Clinical experience would appear to indicate that mortality is related to age at which infection develops, the prognosis being more unfavorable the younger the child. That this is so in our series is shown in Table 6, where the patients are grouped according to the age at which the tuberculin test was found to be positive. The proportions of white and colored, respectively, are substantially identical in the three age-groups shown in this table and in consequence no separation is made for race. Children found to be infected before six months of age had a mortality of 33.3 per cent within the first year of observation, and of nearly 78 per cent within five years subsequent to the discovery of infection. Both the first-year and five-year rates drop sharply for children whose infection was demonstrated after six months of age, the rates being much alike for infections discovered during the second six months of life or during the second year of life. Combining the two latter age-groups, the first-year mortality was 14 per cent and the five-year mortality was about 16 per cent. These rates vary significantly from those for infants *known* to have been infected before six months of age.

It is quite reasonable to suppose that the mortality in this whole

AGE IN MONTHS AT DISCOVERY OF INFECTION	NUMBER OF CASES	DEATHS			
		Within First Year		Within Five Years	
		Number	Per Cent	Number	Per Cent
0-6	21	7	33.3	11	77.6
6-12	45	7	15.6	8	18.0
12-24	104	14	13.5	15	15.1
0-24	170	28	16.5	34	23.2

Table 6. Mortality during first year and during five years of observation in 170 tuberculin-positive infants, according to age when infection was discovered.

series has been higher than the average for children infected within the same age limit; because the children in this study come from the poorer strata of the population and a large proportion of them had been in intimate and more or less prolonged household contact with open cases of pulmonary tuberculosis. Such contact was definitely established in 78 per cent of the white and 64 per cent of the colored children. In the remainder of the cases careful investigation revealed no intrafamilial source of infection; but, as it was not possible to make a complete examination of every member of every family, it is possible that there have been undiscovered cases of tuberculosis in some of the families which gave negative histories.

Since it is generally believed that the severity of infection with the tubercle bacillus is directly related to the size of the infective dose or to the frequency and duration of repeated infection, the records of these children have been carefully studied to ascertain whether or not they show such a relationship; that is, whether the children exposed to demonstrable intrafamilial sources of infection tended to suffer a higher mortality than those for whom no such exposure could be found. The questions involved are more complex than at first appears and can be discussed fully only in a more detailed presentation than can be given at this time. For the present it can only be said that no obvious relationship of this kind has been shown. White children of this series in contact with a sputum-

positive case showed a mortality of 14.8 per cent for the first five years, while those not known to have had such contact within the family suffered a mortality of 6 per cent in the same period. Colored children in known familial exposure had a five-year mortality of 33.9 per cent, as against 25 per cent in those with negative contact history. However, while these differences are suggestive they are not definitely significant in such a small series; and further study of a larger series of cases is required for definitive information.

SUMMARY

1. One hundred seventy children, of whom seventy-two were white and ninety-eight colored, found to be infected with tuberculosis before reaching two years of age, have been kept under observation for periods ranging from one to five years.

2. They can be divided into sixty-seven who showed parenchymal involvement of the lungs at initial X-ray and 103 who showed no definite parenchymal lesion when first examined. Twenty-two, roughly one-third of those with pulmonary lesion when infection was discovered, were ill and presented signs of disease such that a diagnosis could usually have been made by ordinary clinical means. The remaining patients gave no indication of their infection, and a diagnosis could not have been made without the tuberculin reaction and the use of the X-ray.

3. By calculation, following actuarial procedures, the total five-year mortality for white children was found to be 13 per cent and for the colored 31 per cent.

4. Approximately 70 per cent of the deaths which occurred in five years of observation fell within the first year, mostly within the first six months following the discovery of infection. This refers to deaths from all causes, but, with very few exceptions, tuberculosis was the immediate cause of death.

5. Of those admitted with involvement of the lung parenchyma, 31 per cent were dead within the first year of observation, no difference being observed between the two races in case fatality.

6. Among those whose initial chest plates showed no parenchymal involvement, mortality during the first year subsequent to the discovery of infection was 6.8 per cent. No deaths occurred among the forty-nine white children of this group, but there were seven deaths among fifty-four colored children.

7. In the entire group of colored children observed, mortality has been more than twice that observed in white children.

8. When the pulmonary lesion has developed sufficiently to be readily demonstrable by X-ray, the fatality is about the same in white as in colored children. However, lesions of this extent are very much more frequent in the colored than in the white, and this appears to account for the fact that the gross mortality in the colored is so much higher.

9. In both white and colored children, mortality has been more than twice as high in those known to be infected during the first six months of life, as in those whose infection was discovered between the ages of six months and two years.

10. In about 78 per cent of the white and 64 per cent of the colored children of this study there was intrafamilial contact with a proved sputum-positive case. The children of each race with known exposure showed a slightly higher mortality than children not known to have been exposed. The difference in mortality is not statistically significant and a detailed study of a larger series must be made to determine the bearing which continued exposure may have upon severity of lesion.

TRENDS IN ANNUAL BIRTH RATES AMONG MARRIED
WOMEN IN SELECTED AREAS ACCORDING TO
NATIVITY, AGE, AND SOCIAL CLASS¹

by CLYDE V. KISER

DESPITE the common knowledge that our general birth rate is declining, we know very little about the impact of this decline on specific groups of our population. Important questions arise concerning the extent of this decrease among women grouped according to residence, nativity, age, and social class. During the past decade the crude birth rate of the foreign-born has declined more rapidly than has that of the native groups. Is this simply due to cessation of immigration with the consequent aging of the foreign-born women, or does it persist when foreign and native wives of the same ages are compared? Foreign-born women live more predominantly in urban centers than do native women. Does the greater decline in fertility of foreign-born persist when women of the same localities are compared? Laboring pursuits constitute a larger proportion of occupations among the foreign-born than among the native-born. How do the trends in native and foreign birth rates compare when the women are restricted to the same broad social-economic groupings? Related to the preceding question is the general one of trends with reference to social class differences in fertility within specific nativity and locality groups. Are the discrepancies in the birth rates of social classes tending to converge, diverge, or are they remaining about the same? Until official data are more adequate and more refined, the student of population problems must depend upon private sources for answers to many questions such as the above. Moreover, until more comprehensive data of any sort are available, he must be content with results from local rather than general situations, with suggestive rather than with conclusive evidence.

¹ From the Milbank Memorial Fund.

SURVEY	DATE	NUMBER FAMILIES
HEALTH AND DEPRESSION SURVEYS		
Greenville, S. C. (Mill Villages)	1933	1,353
New York City (Lower East Side)	1933	1,378
"Poor Areas in Five Cities" (Combined)		6,791
Baltimore	1933	1,392
Cleveland	1933	1,364
Detroit	1933	1,408
Pittsburgh	1933	1,383
Syracuse	1933	1,244
OTHER SURVEYS		
Columbus	1931	2,941
Syracuse	1930-1931	2,890
Brooklyn (Bushwick)	1933	5,135
GRAND TOTAL		20,488

Table 1. Surveys utilized for annual birth rate study, with date of survey and number of families included.

This paper presents an analysis of the annual birth rates from 1900 until 1930 and 1932 among specific groups of white married women of childbearing age. The basic data were derived from several field surveys in which the Milbank Memorial Fund has participated during the past few years. In Table 1, the surveys utilized are listed, together with the date of each survey and the number of families included. These field investigations have been described in greater detail in previous publications, so the comments here are restricted to those particularly relevant to the present analysis.

The Syracuse study of 1930-1931² and the Columbus investigation of 1931 represent attempts to secure a sizable number of family records from representatives of the several broad occupational class-

² The primary purpose of the Syracuse survey of 1930-1931 was to analyze sickness rates in various types of neighborhoods in that City. The original enumeration itself was practically completed in 1930. In all cities the coded annual fertility experience was brought up through the year preceding the enumeration. Therefore, the last year under consideration for women in this Syracuse survey is 1929 and the last five-year period shown in the tables and charts is that centering on 1927.

es. Localities ranging from university neighborhoods to very poor areas were enumerated in each of these two cities.³ The "Health and Depression" survey,⁴ conducted by the United States Public Health Service with the assistance of the Milbank Memorial Fund, had as its primary objective the determination of the effect of the depression upon the health of families of low income. In each selected city the survey was confined to poor areas. Although such restriction obviously renders the fertility data unrepresentative of the entire population of these cities, it has the advantage of supplying a fair degree of constancy to the factor of type of neighborhood. The Bushwick (Brooklyn) survey was confined to one "Health Area," which might be described as a "lower-middle-class" residential area within a metropolis. The houses enumerated ranged in character from tenements and "cold-water flats" to "brown stone fronts" and modest homes with resident owners.

Method of Analysis. In each survey the schedule included provision for entries concerning nativity of husband and wife, usual occupation of the husband, date of birth of wife, date of marriage, age of wife at separation (if marriage had been dissolved for any reason), and a complete birth-date roster of children born to the union.⁵

³ Unfortunately, however, the numbers of families in the professional and unskilled groups were too small to yield reliable annual rates. Birth rates based upon total number of children ever born for each of these classes have been reported in Notestein, F. W. and Kiser, C. V.: Fertility of the Social Classes in the Native White Population of Columbus and Syracuse. *Human Biology*, December, 1934, vi, No. 4, pp. 595-611.

⁴ For further details concerning this survey, see:

(a) Perrott, G. St. J. and Collins, S. D.: *Sickness and the Depression. The Milbank Memorial Fund Quarterly*, October, 1933, xi, No. 4, pp. 281-298.

(b)—Relation of Sickness to Income and Income Change in Ten Surveyed Communities. *Public Health Reports*, United States Public Health Service, May 3, 1935, 50, No. 18, pp. 595-622.

⁵ Except in the case of the "Health and Depression" surveys, complete birth-date rosters of children were solicited from secondary families (married relatives in the household) as well as from primary families. In the "Health and Depression" surveys, complete rosters of children were solicited from all primary families but only for resident children in secondary families. In the latter instance, however, families with all births reported could be identified for inclusion in the analysis by comparing the number of resident children with the single entry concerning total number of children ever born. Experimentation with birth rates based upon total number of children ever born indicated that selections arising from

(Continued on page 51)

The above items afford the essential data for computation of a series of annual birth rates among married women of childbearing age according to nativity and social class in the various areas studied. Fundamentally, the procedure was that of ascertaining the number of women who were exposed to the risk of childbirth (married and 15-44 years of age) in successive calendar years since 1900, and the annual number of live births to these women according to age of wife, nativity of husband and wife, and social class of husband.⁶

Certain limitations are imposed by the present method of analyzing past fertility trends of a population surveyed at the end of the period under investigation. Records were secured only from families in which the husband or wife was alive and resident in the household at the time of the enumeration. Questions of bias in the sample of older women thus secured become relevant on the basis of a possible association between fertility and longevity of women. If such an association exists, it is probably not strong,⁷ and the resulting bias would lose some of its force in the present analysis because broken marriages survived by husbands are included.

the omission of all secondary families are virtually removed by the inclusion of (1) the identified secondary families in which birth dates of all children were available, and (2) the childless secondary families. Remaining secondary families enumerated in the "Health and Depression" surveys were not used in this analysis.

⁶ In planning the punch cards, it was possible to code, in addition to basic descriptive data, the "calendar year wife entered exposure," the "calendar year wife left exposure," and year of birth of successive children. The "year wife entered exposure" was identical with year of marriage if the wife was 15-44 at marriage. If the wife's age at marriage was 45 or more, the woman was coded as never having been in exposure and was eliminated from the final analysis. If she was under 15 at marriage, the year of her fifteenth birthday was taken as "year entered exposure." The "year wife left exposure" was the calendar year she reached her forty-fifth birthday, if her marriage remained unbroken until that time. If marriage was dissolved before the wife reached 45, the calendar year of such termination was used. The specific calendar year during which a woman entered or departed from the period of exposure was arbitrarily assigned a value of six months instead of the full year. By utilizing birth dates of wives, it was possible to tabulate "woman-years" exposures and live births according to ages of wives in successive years.

⁷ On the basis of a critical study of the subject, Freeman concludes: "There probably is a low positive correlation between the duration of life and the number of offspring borne, in married women who have survived the reproductive period . . . However, the correlations are all of such a low order that changes in the mean duration of life associated with increasing numbers of offspring are of no practical importance." See Freeman, Bettie C.: *Fertility and Longevity in Married Women Dying after the End of the Reproductive Period. Human Biology*, September, 1935, vii, No. 3, pp. 392-418.

More important are the differences in the age composition of the women at different dates. Part of this is the result of the fact that all data were secured from marriages in which at least one member survived to the date of enumeration. As a result, the women in exposure during the initial years of the period under study are unduly weighted by individuals who were in the early stages of the childbearing period at that time. Thus, age-standardization of birth rates is doubly important in data of this type.

It should also be remembered that the residence and social class data referred to the time of the survey and not to each successive year under investigation. Had the sizes of the samples justified the procedure, the present analysis might have been restricted approximately to families whose place of residence and whose occupational levels remained unchanged during the fertile years of married life.⁸

⁸ The coding of residence since marriage permits an approximate determination of proportions of families making important changes in residence or social class. Among native-whites in northern cities, the following proportions had spent all or most of their first ten years of married life in villages or open country: "poor areas in five cities," 7 per cent; Bushwick, less than 1 per cent; Lower East Side (New York City), less than 1 per cent; Columbus, 19 per cent; and Syracuse, 9 per cent. Twenty-one per cent of the native-white women enumerated in the Greenville mill villages had spent all or most of the first ten years of married life in the open country. Among the foreign-whites considered, the following proportions had spent most of their first ten years of married life abroad: "poor areas in five cities," 18 per cent; Bushwick, 6 per cent; and Lower East Side, 16 per cent.

The coding also provided for social class of husband at marriage, based upon replies to questions concerning occupations at marriage. In examining the occupational origins of the enumerated professional, business, skilled, and unskilled classes separately, the following proportions of the total native groups were found to have begun their marital careers in a broad occupational group different from that recorded as "usual social class:" "poor areas in five cities," 18 per cent; Bushwick, 10 per cent; Lower East Side, 16 per cent; Greenville, 24 per cent; Columbus, 26 per cent; and Syracuse (1930-1931), 17 per cent. Among the foreign groups, corresponding proportions were: "poor areas in five cities," 25 per cent; Bushwick, 12 per cent; and Lower East Side, 16 per cent.

Even in samples with fairly high ratios of important change in residence or social class, however, the spatial and occupational shifts have little bearing upon the data for the last ten to fifteen years of the period under study. In Greenville, for instance, the above described rural origins of marriages were found among 5 per cent of women married under 10 years, 15 per cent of those married 10-19 years, 38 per cent of those married 20-29 years, and among 63 per cent of women married 30 years or more. In the "poor areas in five cities," foreign women spending most of the first ten years of marriage abroad constituted only 5 per cent of women married less than 10 years, 9 per cent of those married 10-19 years, 20 per cent of those married 20-29 years, and 43 per cent of women married 30 years or more. The association of occupational shifts with duration of marriage is illustrated by the native business and skilled groups in Columbus. In the business class, the proportions beginning married life in a different broad occupational group were 15 per cent,

(Continued on page 53)

Such was not the case, however, as may be seen from later discussion of steps which were taken to maintain sizable numbers in the necessary subdivisions of data. In justice to the above lack of refinement, it should be stated that the limitations have little or no bearing on fertility comparisons by nativity and social class in recent years. Furthermore, the social class designations were determined from the entry "usual occupation of husband," a datum which was not necessarily identical with occupation at the time of enumeration, for the surveys were made during the depression. The designated "usual occupation," therefore, may reasonably be accepted as a fairly long-standing badge of social status.

Large numbers of women are required if chance fluctuations in annual birth rates are to be eliminated. After the present data were restricted to married women of childbearing age in the successive years considered and were further divided by nativity, social class, and age, the numbers in certain categories were very small. Several steps were taken to meet this situation. The "Health and Depression" data for Baltimore, Cleveland, Detroit, Pittsburgh, and Syracuse were combined and labeled "poor areas in five cities." Although the crude birth rates in these cities vary, the combination for purposes of studying trends in specific nativity, age, and social class groups appeared justified on the basis of rough similarity in size and location of these cities, and on the basis of similarity in type of neighborhood canvassed and number of families procured. Another step which has been taken to smooth out irregularities accruing from small numbers is the presentation of rates in terms of five-year moving averages centered on successive years. This procedure necessarily masks the characteristics of a specific year, but the elimination of sharp annual fluctuations is advantageous for the observance of trends. It is apparent, therefore, that the rates presented in this report do not warrant close interpretation. Their value con-

30 per cent, 35 per cent, and 44 per cent, respectively, for the four durations of marriage. Corresponding figures for the skilled class were 11 per cent, 18 per cent, 18 per cent, and 33 per cent, respectively.

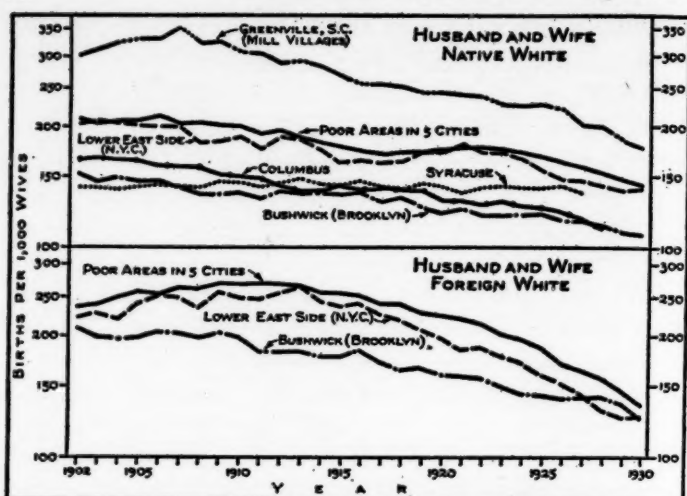


Fig. 1. Areal differences in levels and trends of birth rates among native and foreign-white married women of childbearing age. Annual rates per 1,000 wives are five-year moving averages, standardized for age, as shown in Tables 2 and 3.

sists in suggestive indications of relative trends in birth rates among specific groups of women.

Standardized Birth Rates by Area and Nativity. For systematic discussion, we shall be concerned, first, with series of standardized birth rates according to area and nativity; next, with age-specific birth rates according to area and nativity; and finally, with standardized birth rates⁹ according to area, nativity,¹⁰ and social class. The areal comparisons in levels and trends of birth rates among native and foreign groups may be seen at a glance from Figure 1, based upon Tables 2 and 3. Foreign-born groups were sufficiently large only for the "poor areas in five cities," the Lower East Side, and Bushwick. All rates have been plotted on semi-logarithmic paper in order to portray relative rates of change.

⁹ The standard used throughout this report is based upon the age distribution of urban white married females, 15-44, in the United States, as computed from the 1930 United States Census.

¹⁰ Throughout this paper the specified nativity refers to husbands as well as to wives. Native-foreign unions were not included in this analysis.

With respect to levels of fertility among native-white marriages, Table 2, Figure 1 (top), the points of chief interest are that (a) highest rates in the series are those observed among native-white women enumerated in the textile districts of Greenville, South Carolina, and surrounding villages; (b) much lower but still relatively high rates are indicated for women included in the "Health and Depression" surveys of poor areas in five northern cities and the Lower East Side (New York City); (c) rates are low among women represented in the Bushwick, Columbus, and Syracuse (1930-1931) surveys, for these were by no means confined to poor

Table 2. Average annual number of live births per 1,000 native-white married women of childbearing age in specified areas.¹ (Rates have been standardized for age and represent average annual fertility during the five-year period centering on specified dates.)

MID-YEAR OF FIVE-YEAR PERIOD	MILL VILLAGES GREENVILLE S. C.	POOR AREAS IN FIVE CITIES	LOWER EAST SIDE (N. Y. C.)	COLUMBUS	SYRACUSE (1930-1931)	BUSHWICK (Brooklyn)
RATE PER 1,000 WOMAN-YEARS						
1902	301	208	205	165	141	153
1905	335	207	201	164	142	145
1910	310	200	190	150	145	138
1915	269	179	163	143	143	137
1920	245	176	175	132	142	122
1925	227	169	157	126	141	122
1928	199	153	143	112	137 ²	113
1930	177	143	141	—	—	108
NUMBER OF WOMAN-YEARS						
1902	719	2,085	287	3,168	1,942	3,006
1905	967	2,608	348	3,701	2,273	3,538
1910	1,423	3,527	503	4,639	2,885	4,507
1915	1,981	4,769	647	5,485	3,614	5,503
1920	2,531	6,375	863	6,289	4,587	6,432
1925	3,279	8,349	1,212	6,813	5,487	7,467
1928	3,856	9,489	1,391	6,957	5,755 ²	7,949
1930	4,201	10,137	1,447	—	—	8,125

¹This and succeeding tables are skeleton arrangements of the full data. The woman-years observed are stated in full numbers. Half-year fractions were raised if the preceding digit was an even number and dropped if preceding digit was odd.

²Refers to five-year period centering on 1927. See footnote 2.

MID-YEAR OF FIVE-YEAR PERIOD	POOR AREAS IN FIVE CITIES	LOWER EAST SIDE (N.Y.C.)	BUSHWICK (Brooklyn)
	RATE PER 1,000 WOMAN-YEARS		
1902	240	224	211
1905	258	243	199
1910	271	251	200
1915	258	238	177
1920	226	201	160
1925	188	162	143
1930	136	127	126
	NUMBER OF WOMAN-YEARS		
1902	1,938	643	1,987
1905	2,615	789	2,121
1910	3,903	1,129	2,311
1915	5,257	1,534	2,401
1920	6,121	1,868	2,491
1925	6,568	2,047	2,582
1930	5,817	1,907	2,661

Table 3. Average annual number of live births per 1,000 foreign-white married women of childbearing age in specified areas. (Rates have been standardized for age.)

areas. Among these three cities, Bushwick was characterized by lowest fertility levels, perhaps due to metropolitan influence as well as to the fairly wide range of economic status represented.

The birth rates presented in the top section of Figure 1 are also of value for their bearing on the general question of declines in fertility of native-white stock. Our knowledge concerning this question has been very limited due to the inadequacies of official data for such an analysis. It is clear that in no area are the rates observed at the end of the period as high as those observed at the beginning. On the other hand, the nature of the trend lines ranges from that for women in Greenville mill villages, in which a fairly continuous decline in high fertility is observed since 1907, to that for women included in the Syracuse (1930-1931) survey, which shows no decline whatsoever²¹ until about 1926. In the other areas,

²¹ A previous attempt to analyze trends in the fertility of native-white groups covered in the Columbus and Syracuse (1930-1931) surveys was made by comparison of cumula-

(Continued on page 57)

periods of varying rates of decline appear to have been interrupted by periods of fairly stationary fertility. On the basis of these data, it would seem that generalizations concerning trends in fertility of native-white women cannot neglect reference to area, urbanism, levels of birth rates, and period of time considered.

In regard to areal differences in levels of birth rates among foreign-born women, essentially the same type of comparison is found, Table 3, lower section of Figure 1. Until recent years, at least, the foreign-born women in the sample rigidly confined to poor areas both in the five cities and in the Lower East Side, have been more fertile than those drawn from Bushwick.

The trends in birth rates of the foreign groups differ radically from those observed among native-whites of the same area. Especially sharp declines from previously high levels of fertility were observed among the foreign groups enumerated in the "poor areas in five cities" and in the Lower East Side (New York City).¹² From approximately 1920 until the end of the period the rate of decline of birth rates of foreign groups doubled that of native groups in the same areas. In the "poor areas in five cities," the declines were 40 per cent among the foreign groups and 19 per cent among native groups. In the Lower East Side they were 37 per cent and 19 per cent, respectively, and in Bushwick, 22 per cent and 11 per cent.

In the "poor areas in five cities" and in the Lower East Side, the birth rates of foreign groups at the end of the period under study were actually as low or lower than those observed among native

tive birth rates according to social class, date and duration of marriage. The professional, business, and skilled classes were separately analyzed in each city. With the type of rate employed, the Columbus business class was alone in indicating decline, except in very recent years, among native-white women of specific social status. See Notestein, F. W. and Kiser, C. V.: *op. cit.*, pp. 605-611.

¹² The upward trends in birth rates during the few initial years, observed among foreign women enumerated in the "poor areas of five cities" and in the Lower East Side and among native-white women in Greenville, South Carolina, possibly do not reflect true situations. The upward trend shown may be the spurious result of small numbers in the samples for those years, but it appears more likely to arise from under-enumeration of births occurring 20-30 years before the enumeration. Failure to report such births would appear more likely among women having many to report and especially among foreign-born women with limited use of the English language.

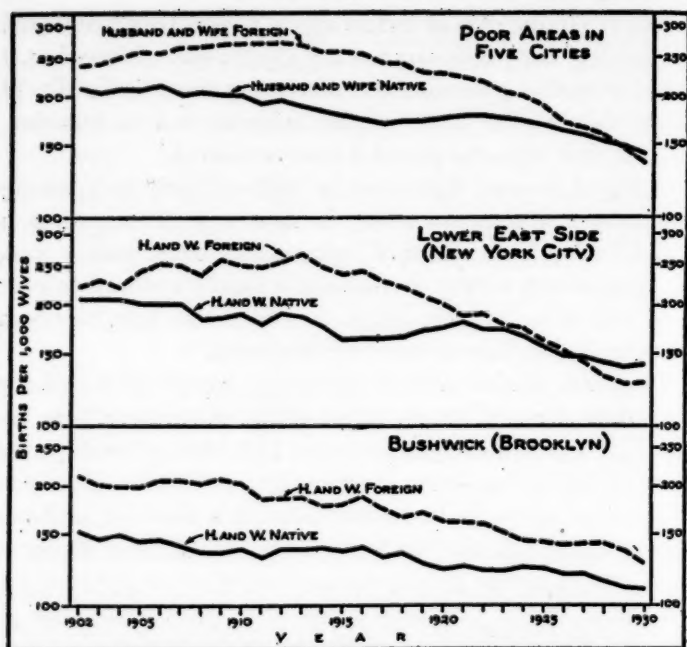


Fig. 2. Differences by nativity in levels and trends of birth rates in specified areas. Annual rates per 1,000 wives are five-year moving averages, standardized for age, as shown in Tables 2 and 3.

groups. Knowledge of this situation may come as a surprise to those who were schooled in the urban sociology of fifteen years ago, when the high fertility rates of immigrant groups were posited as an acute social problem. It should be emphasized that this situation exists independently of the influence of such factors as cessation of immigration and aging of the foreign women, for we are here dealing with standardized and age-specific birth rates in surveyed populations.¹³ Graphic comparisons by nativity are available in Figure 2, in which the birth rates of native and foreign groups are shown

¹³ It is possible that the process of selection of large families into poor urban neighborhoods operates more strongly among native groups than among foreign groups. Even if this were the case, however, it would have little bearing upon the conspicuous nativity differences in the trends observed.

together for each of three sets of data yielding such analysis. It is evident that in the "poor areas in five cities" and in the Lower East Side the formerly marked excess of birth rates among foreign groups over those of native groups no longer exists. Although the observed differences in the direction of higher fertility among the native women are too small for application beyond the above two samples,¹⁴ yet it is safe to say that at the end of the period foreign women were no longer more fertile than the native women in the two specified areas. If the last observed trends have continued, the foreign women in those areas are today less fertile than their native-white neighbors.

The earlier convergence of the rates in the Lower East Side arises from the fact that here continuous declines in birth rates began five to eight years earlier among the foreign-born than among the native. This may be due to a combination of factors which are peculiar to this area, such as the greater homogeneity in type of neighborhood (since only one area was involved). Too, the metropolitan influence on the foreign-born may have operated to bring about an earlier decline in their fertility. In Bushwick, characterized by wider ranges in economic status, the higher fertility rates of the foreign women persist throughout the period under study, but the differences have diminished considerably.

Birth Rates According to Age and Nativity. Foregoing rates have been standardized for age but it is of interest to examine the areal

¹⁴ The following figures indicate the degree of reliability of observed nativity differences in fertility among women drawn from the "poor areas in five cities," Bushwick, and the Lower East Side. It will be seen that at the end of the period under study the excess of native fertility over foreign fertility was scarcely significant in the "poor areas in five cities" and was not significant in the Lower East Side. The excess of foreign fertility in Bushwick was statistically reliable.

AREA	RATES 1928-1932		DIFFERENCE \pm STANDARD ERROR
	Native	Foreign	
"Five Cities"	143	136	7 \pm 5.7
Bushwick	108	126	18 \pm 7.1
Lower East Side	141	127	14 \pm 14.3

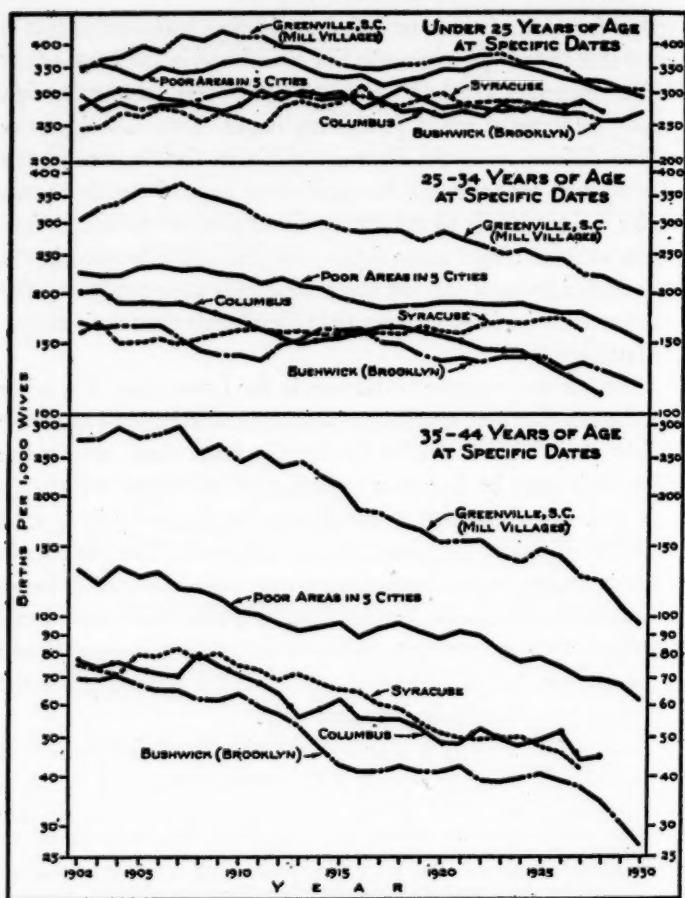


Fig. 3. Areal comparisons in levels and trends of birth rates for native-white married women of specific ages. Annual rates per 1,000 wives are five-year moving averages for which skeleton data are presented in Tables 4, 5, and 6.

and nativity comparisons of levels and trends in fertility among women within identical age groups. In Figure 3 (plotted from data represented by Tables 4, 5, and 6), the average annual birth rates

MID-YEAR OF FIVE-YEAR PERIOD	AGE OF WOMEN AT SPECIFIED DATES						
	Under 25		25-34		35-44		
	Native	Foreign	Native	Foreign	Native	Foreign	
	RATE PER 1,000 WOMAN-YEARS						
	1902	341	354	227	277	119	148
1905	324	350	234	302	116	171	
1910	360	390	224	315	102	170	
1915	322	395	195	290	97	164	
1920	342	349	191	242	88	152	
1925	337	346	183	187	79	119	
1930	293	278	158	146	61	65	
	NUMBER OF WOMAN-YEARS						
	1902	539	631	1,011	896	534	411
	1905	663	865	1,216	1,170	729	581
	1910	933	1,185	1,481	1,797	1,113	920
	1915	1,337	1,353	1,963	2,580	1,469	1,325
	1920	1,756	1,008	2,811	3,088	1,808	2,025
	1925	2,187	737	3,756	2,882	2,405	2,949
	1930	2,464	363	4,431	2,073	3,241	3,381

Table 4. Average annual number of live births per 1,000 married white women of specified age and nativity in "poor areas in five cities."

are shown, by area,¹⁵ for native-white married women under 25, 25-34, and 35-44 years of age. Corresponding data for foreign marriages are presented in Figure 4, based upon Tables 4 and 5. Several striking points emerge from this analysis. In the first place, comparison of the upper and lower sections of Figures 3 and 4 clearly shows that in each area and in both nativity groups declines in fertility have been smallest among the youngest married women and most conspicuous among those in the later ages of the child-bearing period.¹⁶ In the second place, the areal differences in levels

¹⁵ The Lower East Side sample was inadequate for analysis of age-specific birth rates, by nativity.

¹⁶ The above findings are similar to the results secured from available analyses of official data. See (a) Thompson, W. S. and Whelpton, P. K.: *POPULATION TRENDS IN THE UNITED STATES*. New York, McGraw-Hill Book Company, 1933, pp. 269-271; (b) Kiser, C. V.: *Recent Trends in Birth Rates Among Foreign and Native-White Married Women in* (Continued on page 62)

MID-YEAR OF FIVE-YEAR PERIOD	AGE OF WOMEN AT SPECIFIED DATES					
	Under 25		25-34		35-44	
	Native	Foreign	Native	Foreign	Native	Foreign
	RATE PER 1,000 WOMAN-YEARS					
1902	295	373	172	242	69	106
1905	269	336	166	242	68	93
1910	300	330	141	242	64	99
1915	289	298	163	221	43	79
1920	273	318	136	175	41	75
1925	270	289	140	149	40	71
1930	269	224	118	156	27	53
	NUMBER OF WOMAN-YEARS					
1902	545	292	1,501	853	995	842
1905	627	330	1,697	835	1,214	956
1910	876	391	1,957	897	1,675	1,023
1915	885	383	2,601	993	2,017	1,026
1920	979	299	3,091	1,163	2,361	1,028
1925	1,097	249	3,219	1,149	3,151	1,185
1930	1,158	161	3,300	1,124	3,667	1,377

Table 5. Average annual number of live births per 1,000 married white women of specified age and nativity in Bushwick. (Rates have been standardized for age.)

of annual birth rates were smallest among youngest women and greatest among the oldest women. This was true for the native and foreign groups. It would appear that the net areal differences in fertility (observed in Figures 1 and 2) arise largely from differences in the extent to which women continue bearing children in the advanced fertile years of married life. In this connection it is interesting to note the extremely high birth rates of Greenville women 35-44 during the early years of the period under study. More closely than in any other area did these rates approach those for women under 25.¹⁷

In the third place, the previously observed areal differences in Up-State New York. The Milbank Memorial Fund Quarterly, April, 1936, xiv, No. 2, pp. 173-179.

¹⁷ This fact is probably associated with the high proportion of rural origins of marriages of long duration in this area (see footnote 8).

MID-YEAR OF FIVE-YEAR PERIOD	AGE OF WOMEN AT SPECIFIED DATES								
	Under 25			25-34			35-44		
	Columbus	Syracuse (1930-31)	Greenville S. C.	Columbus	Syracuse (1930-31)	Greenville S. C.	Columbus	Syracuse (1930-31)	Greenville S. C.
RATE PER 1,000 WOMAN-YEARS									
1902	275	244	340	203	160	308	78	76	277
1905	302	259	388	191	151	364	74	81	280
1910	277	258	409	171	163	331	72	75	243
1915	297	282	351	156	158	289	62	66	212
1920	262	301	363	156	161	284	48	51	152
1925	280	274	357	136	173	248	49	47	148
1928	265	285 ¹	318	113	164 ¹	223	45	42 ¹	122
1930	—	—	303	—	—	201	—	—	95
NUMBER OF WOMAN-YEARS									
1902	615	360	318	1,577	933	311	977	649	79
1905	649	424	405	1,831	1,070	440	1,221	779	121
1910	804	500	531	2,097	1,359	637	1,738	1,026	255
1915	863	561	701	2,446	1,707	809	2,177	1,346	471
1920	951	705	803	2,807	2,125	1,077	2,530	1,757	651
1925	933	761	1,121	2,913	2,555	1,312	2,967	2,171	846
1928	981	734 ¹	1,428	2,767	2,683 ¹	1,421	3,209	2,338 ¹	1,007
1930	—	—	1,500	—	—	1,546	—	—	1,155

¹Refers to five-year period centering on 1927. See Footnote 2.

Table 6. Average annual number of live births per 1,000 native-white married women of specified age in Columbus, Syracuse (1930-1931) and Greenville areas. (Rates have been standardized for age.)

trends of birth rates of native-whites did not exist uniformly in the three age groups. Figure 1, for instance, dealing with the total native women in each area, brings out the contrast between a practically stationary birth rate in Syracuse and a sharp downward trend in Greenville. When, however, the data are broken down by age classifications, no such decided contrast appears. It is most surprising that even in the City of Syracuse, characterized by low and stationary fertility, the birth rate of women in the group 35-44 years of age has declined since about 1910 at a rate approximating that found among women of these ages in the high birth rate area of Greenville. It is only among women 25-34 that the areal differences

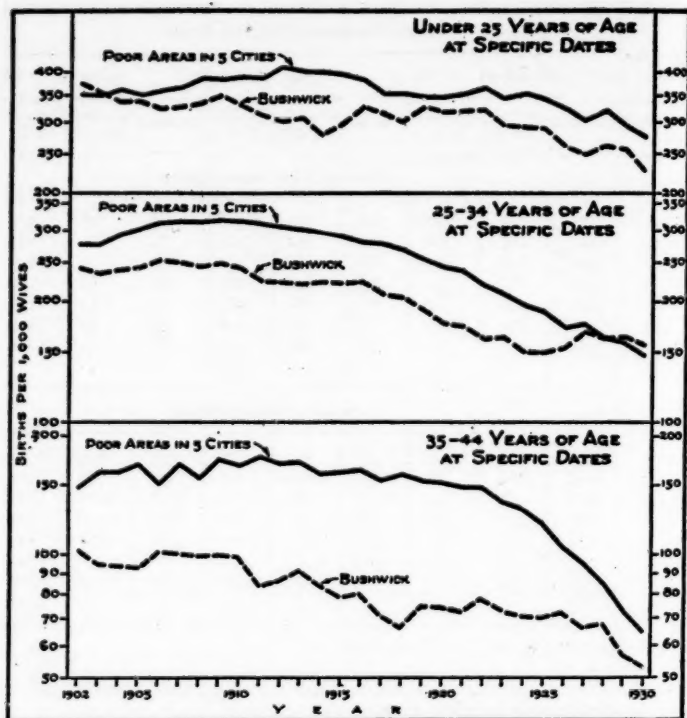


Fig. 4. Areal comparisons in levels and trends of birth rates for foreign-white married women of specific ages. Annual rates per 1,000 wives are five-year moving averages for which skeleton data are presented in Tables 4 and 5.

observed in Figure 1 persist in strong fashion, for when the groups under 25 are isolated the areal contrasts in trends are again diminished. Among Greenville and Lower East Side women of the youngest ages, slight but interrupted declines have taken place and the trends of rates in these two areas are strikingly alike. Barring the slow but persistent upward trend visible in the rate for Syracuse at the beginning of the period, the trends in fertility of the youngest women in three "low birth rate" areas (Bushwick, Columbus, and Syracuse) have been very similar.

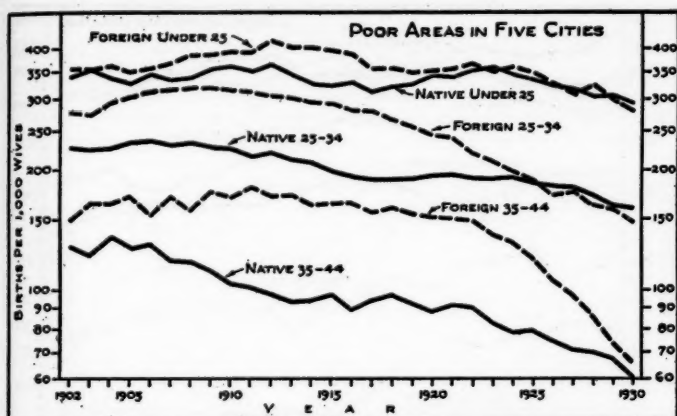


Fig. 5. Nativity comparisons in levels and trends of age-specific birth rates for married white women in the "poor areas in five cities." Annual rates per 1,000 wives are five-year moving averages for which skeleton data are shown in Table 4.

The differences in trends among foreign women in the "poor areas in five cities" and in Bushwick are likewise not uniform in the various age groups. Unlike the trends for native women, those for the foreign-born were most dissimilar in the oldest age group during the close of the period studied. Until 1922 fertility trends among the oldest foreign-born women in the two areas concerned were fairly alike, but about that time the rates for the foreign women in the "poor areas in five cities" began to drop precipitately from their previously high level while the lower rates among the foreign women in Bushwick continued their gradual decline. On the other hand, like those of the native group, fertility trends among the foreign women under 25 were quite similar in the two areas considered.

In order to bring out the nativity differences in levels and trends of birth rates among women of the same age, the data for the "poor areas in five cities" and Bushwick have been re-plotted in Figures 5 and 6. A fact of arresting interest is revealed in Figure 5. It appears that in the "poor areas in five cities" equalization of birth rates

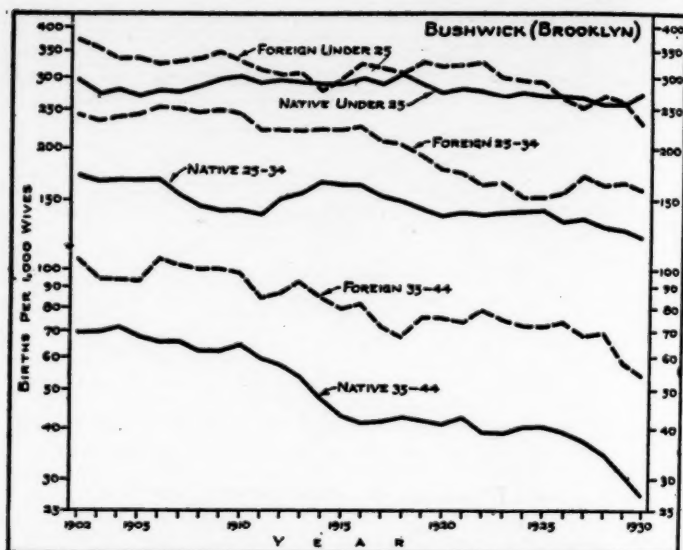


Fig. 6. Nativity comparisons in levels and trends of age-specific birth rates for married white women in Bushwick. Annual rates per 1,000 wives are five-year moving averages, as shown in Table 5.

among native and foreign women 35-44 years of age was just beginning to be attained at the end of the period under investigation. Similarity of birth rates was reached about six years earlier among women 25-34 and about ten years earlier among women under 25. This situation arose from the fact that prior disparities in native-foreign rates were greatest among women of the oldest ages and least in evidence among the youngest. Furthermore, although the decline in fertility of the foreign women in the oldest ages was strikingly abrupt, the advent of the decline itself was later than that observed either among native women of the same age or among foreign women of younger ages.

A similar association of nativity differences in fertility with age of women is observed from the Bushwick data, Figure 6. Throughout the period, there was little substantial nativity difference in the

MID-YEAR OF FIVE-YEAR PERIOD	POOR AREAS IN FIVE CITIES						COLUMBUS	
	Business		Skilled		Unskilled		Business	Skilled
	Native	Foreign	Native	Foreign	Native	Foreign	Native	Native
RATE PER 1,000 WOMAN-YEARS								
1902	170	233	212	233	209	253	158	165
1905	175	258	207	252	218	254	162	156
1910	155	250	204	261	206	265	140	145
1915	168	214	180	234	189	281	129	142
1920	159	190	177	197	193	262	124	135
1925	139	177	168	178	206	205	111	135
1928	141	124	154	150	168	185	105	122
1930	124	116	145	128	153	160	—	—
NUMBER OF WOMAN-YEARS								
1902	293	352	1,237	1,239	832	921	1,321	1,075
1905	361	433	1,556	1,605	957	1,201	1,601	1,308
1910	490	559	2,157	2,310	1,151	1,723	2,073	1,684
1915	637	711	3,019	3,002	1,369	2,264	2,502	1,957
1920	802	759	4,179	3,559	1,659	2,541	2,899	2,299
1925	1,116	818	5,509	3,945	2,021	2,578	3,010	2,655
1928	1,345	775	6,193	3,789	2,215	2,362	2,959	2,819
1930	1,521	687	6,548	3,451	2,138	2,110	—	—

Table 7. Average annual number of live births per 1,000 married white women of childbearing age according to social class and nativity in "poor areas in five cities" and in Columbus. (Rates have been standardized for age.)

fertility of women under 25, and the previous excess of foreign fertility among women 25-34 diminished considerably toward the end of the period. On the other hand, a strong persistence of the disparity in foreign-native birth rates is seen among women 35-44. There have been fairly continuous declines in the upper-age fertility of both nativity groups in Bushwick, but rates of decrease have been practically uniform. This may be inherent in the fact that the levels of the birth rates of both nativity groups have been very low relative to those of women of comparable age and nativity in the poor areas.

Trends in Birth Rates by Social Class and Nativity. Since laboring pursuits are more frequently represented among urban foreign

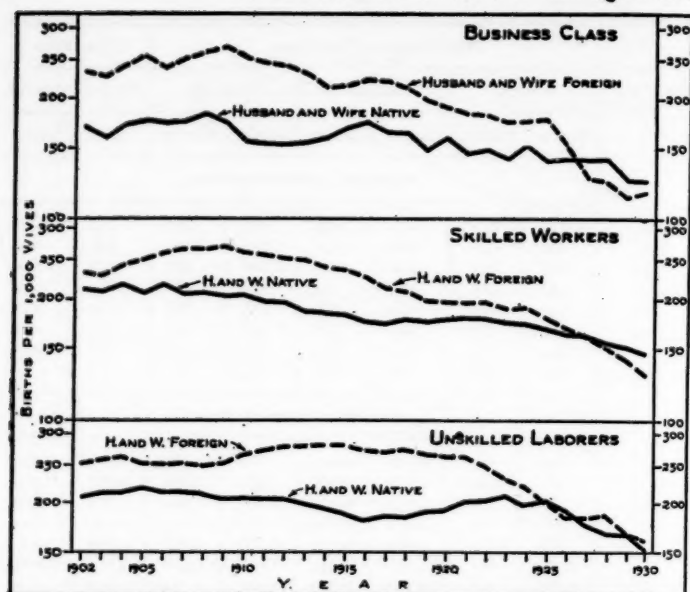


Fig. 7. Nativity comparisons in levels and trends of birth rates among white married women of specified occupational groups in the "poor areas in five cities." Annual rates per 1,000 wives are five-year moving averages, standardized for age, as shown in Table 7.

groups than among native groups in the same areas, it is of interest to compare birth rates among groups of different nativity but of the same broad occupational class. Such comparison could be made among representatives of the business, skilled, and unskilled classes in the "poor areas in five cities" and in Bushwick. From Table 7 and Figure 7, it is apparent that among women included in the surveys of "poor areas in five cities" the disappearance or reversal of the former excess in foreign fertility has definitely occurred in each of the social-economic groups.¹⁸ Furthermore, these data suggest that in the "poor areas in five cities" the equalization in birth rates of the total native and foreign groups (Figure 2) was delayed some-

¹⁸ One should discount the accuracy of the extremely abrupt recent declines in the birth rates of the foreign business group in the "poor areas in five cities," because numbers upon which all rates of this group were based were very small.

MID-YEAR OF FIVE-YEAR PERIOD	BUSHWICK						SYRACUSE (1930-1931)	
	Business		Skilled		Unskilled		Business	Skilled
	Native	Foreign	Native	Foreign	Native	Foreign	Native	Native
RATE PER 1,000 WOMAN-YEARS								
1902	137	209	160	203	186	215	133	147
1905	130	172	153	191	178	213	139	157
1910	126	172	145	192	180	252	129	155
1915	122	169	143	174	188	208	133	154
1920	118	153	123	157	150	192	122	154
1925	103	174	131	137	154	155	130	147
1928	107	178	115	137	133	144	126 ¹	140 ¹
1930	106	136	109	122	111	140	—	—
NUMBER OF WOMAN-YEARS								
1902	927	443	1,664	1,155	275	295	687	797
1905	1,074	458	1,934	1,246	319	324	811	956
1910	1,392	491	2,459	1,351	389	363	1,029	1,293
1915	1,749	517	2,954	1,404	495	380	1,351	1,601
1920	2,106	511	3,423	1,490	547	393	1,643	2,100
1925	2,489	497	3,995	1,585	601	416	1,982	2,546
1928	2,644	479	4,251	1,671	658	416	2,120 ¹	2,611 ¹
1930	2,663	479	4,351	1,696	703	405	—	—

¹ Refers to five-year period centering on 1927. See Footnote 2.

Table 8. Average annual number of live births per 1,000 married white women of childbearing age according to social class and nativity in Bushwick and Syracuse (1930-1931) areas. (Rates have been standardized for age.)

what by differences in social class composition. In each social class considered separately, the birth rates of the foreign groups fell below or dropped as low as those among native groups from two to four years earlier than was the case when social class composition was disregarded.

From the Bushwick data (Table 8, Figure 8) valid comparisons of trends in fertility of native and foreign groups of the same occupational level are limited by the small numbers upon which rates are based for the foreign business class and for the native and foreign unskilled classes. The observed trends for the above groups

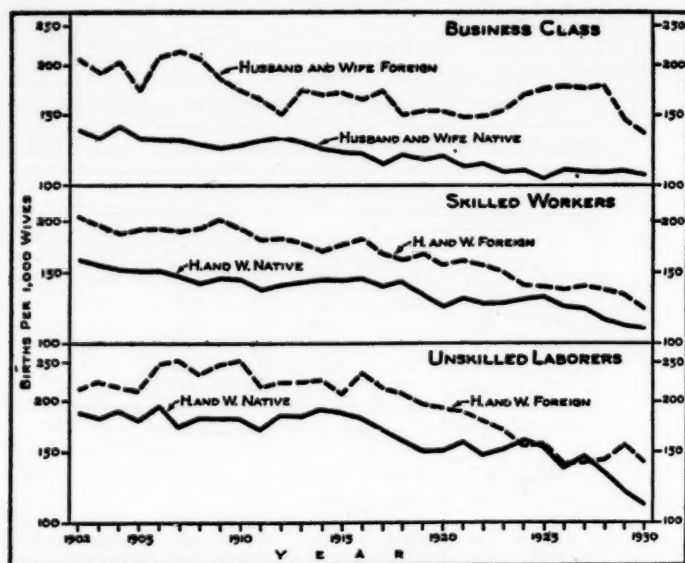


Fig. 8. Nativity comparisons in levels and trends of birth rates among white married women of specified occupational groups in Bushwick. Annual rates per 1,000 wives are five-year moving averages, standardized for age, as shown in Table 8.

are obviously erratic. There is the suggestion, however, that the excess of foreign fertility has persisted more strongly in the business class than in either laboring class. Had larger samples been available, it is likely that they would reveal no nativity difference in the fertility of unskilled laborers at the end of the period under study.¹⁹

It may appear to the reader that the above materials might be used for an indication of trends in the social class differences in fertility among women of the same nativity. For this purpose, however, the value of the data is limited. In the first place, the "Health and Depression" surveys were confined to poor areas. Not only are the ranges of economic status narrow, but it also seems likely that

¹⁹In the "poor areas in five cities" there was no significant nativity difference in the birth rates of either the business or the unskilled class at the end of the period under study. The excess native fertility among the skilled classes was statistically reliable. In Bushwick, birth rates were higher among the foreign-born in each of the three social classes. This

(Continued on page 71)

the occupational groups represented are not equally representative of their respective universes. For instance, unskilled laborers in poor areas are probably fairly representative of that occupational group throughout the respective cities, but this is perhaps not true of skilled workers and is almost surely untrue for the white-collar workers residing in poor neighborhoods. For these reasons, the trends in social class differences in fertility observed there would have limited bearing on the general problem.

An additional limitation is the erratic nature of the rates among occupational groups in which samples were small. This is obviously of more consequence in the exploration of trends in the comparatively narrow social class differences than in the study of the more pronounced nativity differences. For the above reasons, the data are presented in Figure 9 only for the native-white²⁰ business, skilled, and unskilled classes in Bushwick, and for the native-white business and skilled classes in Columbus and Syracuse.

In considering trends in social class differentials in fertility among native-whites of Bushwick, top section of Figure 9, the influence of fluctuations in the birth rates of unskilled laborers

excess of foreign fertility was highly significant in the business group and moderately so in the skilled and unskilled classes.

AREA AND SOCIAL CLASS	RATES 1928-1932		DIFFERENCE \pm STANDARD ERROR
	Native	Foreign	
"Five Cities"			
Business	124	116	8 \pm 15.1
Skilled	145	128	17 \pm 7.3
Unskilled	153	160	7 \pm 11.2
Bushwick			
Business	106	136	30 \pm 15.6
Skilled	209	122	13 \pm 9.1
Unskilled	111	140	29 \pm 20.5

²⁰ The data were inadequate for presenting charts of trends in social class differences among immigrant groups. Actual plotting of the full data suggested, however, that occupational variations in fertility of foreign women were less than those among native groups. In general it appeared that rates for unskilled laborers were higher than those for the business and skilled groups, but the latter two classes were practically undifferentiated as to fertility.

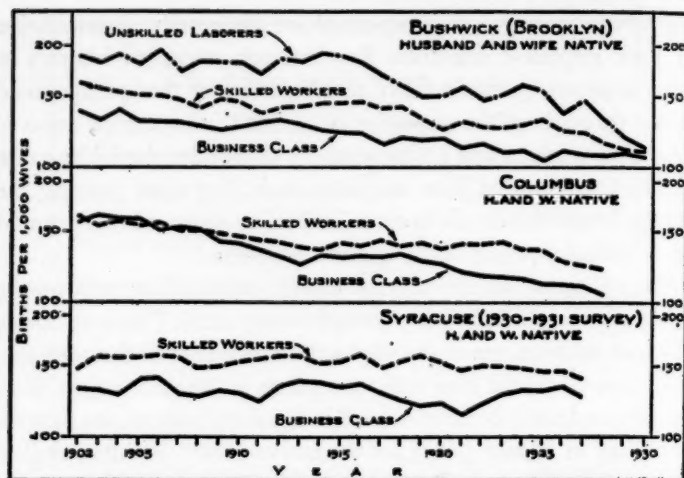


Fig. 9. Occupational comparisons in levels and trends of birth rates among native-white married women of childbearing age in Bushwick, Columbus, and Syracuse. Annual rates per 1,000 wives are five-year moving averages, standardized for age; data for Columbus are shown in Table 7 and for Bushwick and Syracuse in Table 8.

should be discounted because the numbers in this group were small. When this is done, it appears that the variations in fertility among social classes may have remained fairly constant until about 1925, after which time they were reduced. The data, however, do not warrant the conclusion that social class differentials in fertility have disappeared in Bushwick. The rates for the skilled and business classes alone are based upon fairly substantial numbers, but this cannot be said for the unskilled class, and representatives from the professional class are absent altogether.

The lack of differentiation between the Columbus native skilled and business classes during the early part of the period probably arises from the rather high proportion of rural origins among families included in that sample.²¹ The differences between these classes

²¹ Studies based upon samples drawn from the 1910 Census schedules and concerning total number of children born to native-white marriages have established the fact of business-skilled differentials in fertility among women definitely residing in Columbus in 1910. See Notestein and Kiser, *op. cit.*, p. 600.

in Columbus appear to have been widest about 1923, middle section of Figure 9. There may have been some convergence since that time. At all events, the rates of the two classes did not diverge during the last five years under investigation.

The general conclusion derived from the Syracuse data, lower section of Figure 9, is that throughout the major part of the period under study the business-skilled differentials in fertility have remained fairly constant among native-whites in that City. The rates for both classes were as high during the five-year period centering on 1926 as they were during the initial mid-year, 1902. Uniform rates of decline in the two classes are shown when the mid-years 1926 and 1927 are compared. The fluctuations observed in the rates for the business class are probably not real, but there is the suggestion that the business-skilled differences were enhanced from about 1916 to 1921 and were diminished to former ratios during the quinquennium 1922-1926.²²

Concerning recent general trends, therefore, about all that can be said with assurance is that during recent years the social class differences have not widened. It is possible that some convergence took place, but these data afford no conclusive evidence on this point.

The results of this study clearly indicate that declines in birth rates have not fallen with equal force upon all areas or upon all elements of the population within the same area. The most important points brought out by the investigation may be summarized as follows:

(1) In general, net declines during the period under study have been least in areas characterized by low birth rates at the beginning

²² Such interpretation is supported fairly well in terms of statistical reliability. The observed decline in the business rate from that of the five-year period centering on 1916 to that of the 1921 mid-year quinquennium was from 136 to 114 (difference 22 ± 11.9 standard error). The business-skilled difference in birth rates during the 1921 mid-year quinquennium was 33 ± 11 standard error. On the other hand, the business-skilled difference during the mid-year 1927 quinquennium was not significant (difference 14 ± 10.0 standard error).

of the period and greatest in areas where fertility rates were formerly very high.

(2) The rates of recent decline have been more striking among the foreign-born than among native-whites, and this remains true apart from such factors as stoppage of immigration, differences in age or social class composition, and proportions residing in cities. In areas characterized by poor economic status, the abrupt decline of fertility among the foreign-born has brought the birth rate of these groups down to levels which are as low as, or lower than, those of the native-whites in the same neighborhoods.

(3) Among both native and foreign-born married women, the rate of decline has been most striking in the group 35-44 years of age and least in evidence among wives under 25. The former excess of fertility of immigrants over that of native groups of the same area, however, was greatest among women of the older ages, and least among women under 25. The net result has been that equalization of birth rates among foreign and native women of the youngest ages has preceded or is preceding such equalization among women in the older ages.

(4) Among women of identical nativity, variations in *levels* of fertility, by area, have been greatest among women 35-44 and least among the youngest women. On the other hand, areal differences in *trends* in birth rates have been absent altogether among women 35-44, greatly diminished among women under 25, and most pronounced among those 25-34.

(5) There is no evidence of any recent enlargement of social class differences in fertility among native-whites in Bushwick, Columbus, and Syracuse samples. On the contrary, although the data are not conclusive on this point, the weight of the evidence points toward some recent contraction of such differences.

URBAN DIFFERENTIAL FERTILITY DURING THE DEPRESSION¹

by HELEN C. GRIFFIN AND G. ST. J. PERROTT

THE existence of fertility differentials between social classes has already been demonstrated by many competent studies. Observers have reported quite uniformly that the poor, the foreign-born, and the manual workers have a much higher birth rate than the better paid native-born white-collar workers; but they have not been able to reach any such degree of agreement as to the relationship between the two variables fertility and social class; that is, whether the social classes arise from fertility differentials, or whether the birth rate is just one of the many traditions that have arisen and been perpetuated within the social classes. This problem has remained unsolved chiefly because static social data are not susceptible to unequivocal interpretation without resort to elaborate statistical procedures of intercorrelation which are often inappropriate to the amount and refinement of the available data, and because most studies of the differential birth rate have been made in periods of relative economic stability. The situation created by the depression, in which large numbers of families were suddenly catapulted from their accustomed position into a lower social stratum, offers particular advantages for an inquiry into the dynamics of the relation between fertility and social class. Social change is the traditional laboratory of the social sciences.

Early in 1933, the Milbank Memorial Fund and the United States Public Health Service undertook a joint study of the effect of the depression upon certain biological characteristics of the population. The primary purpose of this study was to discover the relation between income changes and sickness, but some data were collected at the same time relative to fertility during the four-year

¹ From the Office of Statistical Investigations, United States Public Health Service. The writers are indebted to William T. Parker for his assistance in compiling the data.

depression period. Although these data fall far short of exploiting fully the opportunities offered by the depression for fundamental research into problems of differential fertility, they do show something of what happens to the birth rate of a group when its economic status is reduced, and thus make a small but definite contribution to the large body of descriptive data already collected.

The method and scope of the survey were described fully in the first paper of the Health and Depression series,² and the interested reader is referred to it for a complete statement. At risk of repetition, however, a few of the salient features of the survey are summarized here again. The data were collected in a house-to-house canvass of about 1,000 white families in districts which were poor but not exclusively slums, in each of eight cities: Baltimore, Birmingham, Brooklyn, Cleveland, Detroit, New York City (Manhattan), Pittsburgh, and Syracuse. The units of study were geographical areas. An effort was made to select areas whose populations would lie somewhere in the lower third of the population of the given city, and which would include a fair number of families who were receiving relief. Districts in which one or two nationalities predominated, or which were exclusively slums, or which were not predominantly white were always excluded. Insofar as possible, contiguous areas within each city were canvassed.

Once the areas were selected, every white family living in each survey area was covered regardless of the family's economic status. The facts recorded concerning each family include the number of births in each year in the period 1929-1932, the age of the mother, her nativity, the nativity of the head of the family and his occupation, the family income and relief status in each of the above named years, the employment status of the wage earners, and the marital history of the woman during the four-year period.³

² Perrott, G. St. J. and Collins, Selwyn D.: Relation of Sickness to Income and Income Change. *Public Health Reports*, May 3, 1935, 50, No. 18, pp. 595-622. Reprint No. 1684.

³ Complete marriage and fertility data were obtained, but only those facts relating to the years 1929-1932 were coded and tabulated by the United States Public Health Service. The Milbank Memorial Fund, however, has analyzed these data in considerably more detail.

A report based upon a preliminary and incomplete tabulation of these data has already been made.⁴ The data of this report, unadjusted for nativity or occupation, indicated that families which dropped from comparative comfort in 1929 to poverty in 1932, were more fertile than those which suffered no such loss of income. Similarly, unemployment and a high birth rate were found to be associated. Of the families living on a poverty level in 1932, those which were on relief had a birth rate one-half again as high as those not on relief. Tentative explanations of these relationships were offered.

The present paper will add to the preliminary findings the support of a greater mass of data as well as a more detailed analysis. The characteristics of the surveyed population will be described first, and then the fertility differentials found will be discussed. In the third section of the report, some data will be presented concerning the dynamics of the relationship between the birth rate and economic status. The final section will deal with the fertility problem presented by the relief population.

The Surveyed Population. The economic status of the surveyed populations in the eight separate cities differs somewhat from one city to the next. The distribution of surveyed families in each city was as shown in the accompanying table.

	ALL INCOMES	PER CENT OF FAMILIES WITH TOTAL ANNUAL INCOME OF		
		Under \$1,200	\$1,200-\$1,999	\$2,000 and Over
Baltimore	100	2.8	45	27
Birmingham	100	2.0	37	43
Brooklyn	100	11	38	51
Cleveland	100	35	36	30
Detroit	100	24	37	39
New York	100	25	39	37
Pittsburgh	100	2.8	38	34
Syracuse	100	36	39	25
TOTAL:				
EIGHT CITIES	100	2.6	39	35

⁴ Sydenstricker, Edgar and Perrott, G. St. J.: *Sickness, Unemployment and Differential Fertility*. The Milbank Memorial Fund *Quarterly*, April, 1934, xii, No. 2, pp. 126-133.

When the data for all eight cities are combined they show that the sample studied is overweighted with foreign-born and with skilled workers, as compared with the total United States urban population, and that its median income in 1929 was just 86.8 per cent of the median income of the total urban United States in that year. (See Table 1.) All of these facts constitute a warning that the findings of the present study pertain only to middle-class urban work-

Table 1. Woman-years observed in the surveyed population, classified by nativity, family income, and occupation of head of family; and the United States urban population, classified by nativity of married women 15-44 years of age, family income, and occupation. (Per cent distribution.)

CHARACTERISTIC	SURVEYED POPULATION			UNITED STATES URBAN POPULATION
	Native-Native	Others	Total	
FAMILY INCOME IN 1929	—	—	100.0	100.0 ¹
Under \$600	—	—	6.9	4.0
\$ 600 - 1,199	—	—	19.5	17.4
1,200 - 1,999	—	—	38.5	32.0
2,000 - 2,999	—	—	24.2	21.1
3,000 - 3,999	—	—	7.3	10.2
4,000 and Over	—	—	3.6	15.3
MEDIAN			\$1,650	\$1,900
NATIVITY OF WHITE MARRIED WOMEN			100.0	100.0
Native of Native Parentage	—	—	44.2	52.5
Native of Foreign or Mixed	—	—	21.1	26.4
Foreign-Born	—	—	34.7	21.1
TYPE OF OCCUPATION OF HEAD OF FAMILY ²	100.0	100.0	100.0	100.0 ³
White Collar	22.9	16.6	19.4	41.3
Skilled	64.9	59.8	62.1	31.9
Unskilled	12.2	23.6	18.5	26.8

¹FROM AMERICA'S CAPACITY TO CONSUME by Maurice Leven, Harold G. Moulton, and Clark Warburton. Washington, D. C., The Brookings Institution, 1934.

²This classification may be compared roughly with Dr. Alba M. Edwards' socio-economic grouping of occupations by combining his professional workers, wholesale and retail dealers, other proprietors, managers, and officials, and clerks and kindred workers to form a white-collar class; by combining skilled workers and foremen, semi-skilled workers not in manufacturing, and servants to form a skilled class; and by combining laborers and factory operatives to form an unskilled class.

³All white nonagricultural workers in the United States.

ers' families (weighted as they are with the artisan class, a large proportion of which is foreign-born, with its somewhat lower than average income), rather than to the general urban population of this country.

The married women whose birth rates we are studying lived in families whose incomes were curtailed drastically in the period 1929-1932. (See Table 2.) Three-quarters of the women in families with incomes of \$2,000 or over and of \$1,200 to \$1,999 in 1929 were in families whose incomes had dropped into a lower income class by 1932. The number in families with incomes of less than \$1,200 is 218 per cent higher when the 1932 income classification is used than when the 1929 income classification is used. Thus the population whose fertility is recorded here is one whose economic status underwent marked changes during the four years of the study.

Only women who lived with their husbands continuously in the years 1929 to 1932 have been included in this study. Those who were not married in 1929 and those who were separated from their husbands at any time during the four-year period have been excluded. In this way, the indirect effect of economic change on fertility through its effect on marital history has been eliminated. The re-

Table 2. Woman-years observed classified according to family income in 1929 and in 1932.

ITEM	YEAR	INCOME LEVEL		
		\$2,000 and Over	\$1,200-\$1,999	Under \$1,200
Woman-Years Observed	1929	5,783	7,323	3,610
	1932	1,314	3,936	11,466
Per Cent Distribution	1929	34.6	43.8	21.6
	1932	7.9	23.5	68.6
Per Cent Change in Size of Class, 1929 to 1932		-77.3	-46.3	+217.6
Per Cent of 1929 Class in Lower Income Range in 1932		77.3	71.4	—

maintaining fertility differentials, therefore, are due to practices of family limitation, or to biological differences in capacity for reproduction.

The birth rate⁵ of the surveyed population was somewhat higher than that for the total United States birth registration area, despite the fact that the latter population includes a large proportion of rural dwellers whose birth rate is known to be higher than that characterizing urbanites. The average annual birth rate in the surveyed population was 135 for the period 1929-1932⁶ as compared with a rate of 126 in the birth registration area from 1929-1931.

Fertility Differentials in the Depression. In the families studied, the birth rate among native women of native parentage was 133, while the rate for other women was 136. This fertility differential according to nativity is statistically not significant and is much smaller than that found by other studies, doubtless due to the greater occupational homogeneity of the population included in the present study.

Even in a population as homogeneous in income as that studied in the Health and Depression Study, fertility varies with occupation about as would be expected from studies of larger, more heterogeneous groups. Table 3 shows that the birth rate is lowest in the white-collar class and highest in the unskilled. This gradation of fertility from a low in the white-collar class to a high in the unskilled group persists when the data are made specific for nativity, but the occupational differential is less in the case of the women of foreign or mixed parentage. (This difference between the occupational ranges

⁵ All of the birth rates discussed in this paper are the ratio between the total number of live births and the number of married women 15 to 44 years of age in the population for one year during the stated period, usually 1929-1932. The rates are expressed as the number of births per 1,000 woman-years observed. All rates have been adjusted to the age distribution of the total United States registration area, 1930. Unless there is an express statement to the contrary in the text, all of the rates discussed are at least three times their probable errors, and all differences between rates which are discussed are at least three times the probable error of that difference.

⁶ This rate is 139 for the years 1929-1931. The rate for 1929-1932 becomes 126 if women are included (for the period of exposure to risk of pregnancy) who were separated from their husbands between 1929 and 1932.

TYPE OF OCCUPATION	ALL NATIVITIES	NATIVE-NATIVE	OTHERS
BIRTH RATES PER 1,000 WOMAN-YEARS			
ALL CLASSES			
Adjusted for Occupation and Age	134	134	134
Adjusted Only for Age	135	133	136
White Collar	111	105	118
Skilled	134	134	135
Unskilled	168	178	156
WOMAN-YEARS OBSERVED			
ALL CLASSES	16,716	7,498	9,118
White Collar	3,259	1,741	1,518
Skilled	10,423	4,864	5,559
Unskilled	3,034	893	2,141

Table 3. Birth rates (1929-1932) of women classified by 1929 occupation of head of family and by nativity. (Rate "all nativities" adjusted for nativity as well as for age.)

of the birth rates of these two nativity groups is not of statistically significant magnitude.) Among women of foreign or mixed parentage, the differential between the white-collar and the skilled workers is not significantly large. Table 3 also shows that even the small fertility differential according to nativity disappears when adjustments are made for differences in the occupational distributions of the two groups.

In Table 4, the four-year average birth rate is shown for women classified first according to annual family income in 1929 and second according to annual family income in 1932. (*See also* Figure 1.) Grouped according to 1929 income, the birth rates of the three income classes all differed significantly from one another for all occupations, the rate being lowest among families with incomes of \$2,000 and over and highest among those whose incomes amounted to less than \$1,200.

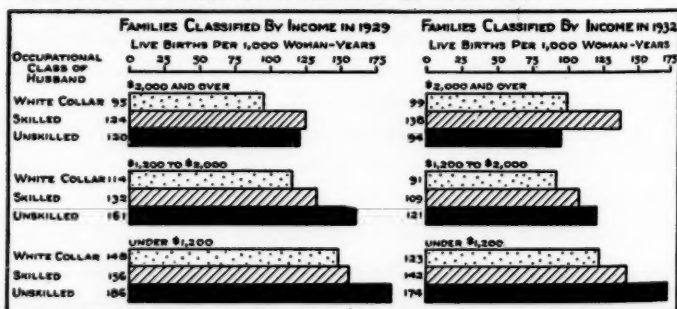
When families are classified according to 1932 income, a somewhat modified picture is presented. It will be remembered that in 1932 the lower income group (under \$1,200) included over three

INCOME CLASS	BIRTH RATES PER 1,000				WOMAN-YEARS OBSERVED			
	All Classes	White Collar	Skilled	Unskilled	All Classes	White Collar	Skilled	Unskilled
1929								
\$2,000 and Over	111	95	124	120	5,783	1,543	3,752	488
\$1,200 to \$1,999	132	114	132	160	7,323	1,255	4,643	1,425
Under \$1,200	161	148	156	186	3,610	461	2,028	1,121
1932								
\$2,000 and Over	110	99	138	94	1,314	551	691	72
\$1,200 to \$1,999	105	91	109	121	3,936	1,055	2,425	456
Under \$1,200	143	123	142	174	11,466	1,653	7,307	2,506

Table 4. Average annual birth rates (1929-1932) of women classified by 1929 occupation of head of household and family income in 1929 and in 1932. (Rates all classes standardized for occupation as well as for nativity and age.)

times as many women as in 1929, the result of accessions during the depression period of women from families formerly in the higher income classes. Classified according to 1929 income, the birth rate of the \$1,200-\$1,999 group is 19 per cent higher, and that of the group under \$1,200 is 45 per cent higher than that of the highest income class (\$2,000 and over); regrouped according to 1932 income, the difference between the two higher income classes has disappeared (the rate for the \$1,200 to \$1,999 class being much lower when income in 1932 is considered than when 1929 income

Fig. 1. Fertility differentials 1929-1932 according to 1929 occupation, and income in 1929 and in 1932. (Rates adjusted for age and nativity.)



is the criterion) and the lowest income group exhibits a birth rate only 30 per cent higher than that of the highest income group. These facts suggest that families in the \$1,200-\$1,999 class in 1929, whose incomes declined, had a considerably higher birth rate than that of other families in the group. This conclusion is substantiated by data shown later in Table 7 where it is indicated that families whose incomes dropped from \$1,200-\$1,999 to less than \$1,200 had a higher birth rate than the families whose incomes were \$1,200-\$1,999 both in 1929 and in 1932.

Since the two upper 1932 income classes are not significantly different from one another with respect to their birth rates, they have been combined to facilitate a comparison of occupational differentials in fertility which would take account of nativity and significant differences in income. Table 5 shows that the birth rate is lowest in the white-collar classes, and highest in the unskilled classes in each nativity and income group, although this difference is not always significant according to the probable error test. Particularly is the

Table 5. Average annual birth rates (1929-1932) among women classified by nativity, family income in 1932, and 1929 occupation of head of household.

OCCUPATION	ALL NATIVITIES		NATIVE-NATIVE		OTHERS	
	\$1,200+	-\$1,200	\$1,200+	-\$1,200	\$1,200+	-\$1,200
	BIRTH RATES					
ALL OCCUPATIONS	108	143	106	144	113	145
White Collar	95	123	100	110	91	139
Skilled	114	142	110	143	120	140
Unskilled	119	174	111	184	118	162
	WOMAN-YEARS OBSERVED					
ALL OCCUPATIONS	5,250	11,466	2,586	4,912	2,664	6,554
White Collar	1,606	1,653	919	822	687	831
Skilled	3,116	7,307	1,542	3,322	1,574	3,985
Unskilled	528	2,506	125	768	403	1,738

difference not significant among families with 1932 incomes of \$1,200 or more. In every occupational and nativity group there is an inverse relation between income and fertility, which is statistically significant when data for all nativities or for all occupations are combined.

Table 5 also shows that the greater occupational differential found among native women of native parentage in Table 3 is confined to the class with annual incomes of less than \$1,200, in which class this difference is significant.

INCOME HISTORY 1929-1932	BIRTH RATE		Difference
	1929-1930	1931-1932	
\$1,200+ to \$1,200+	116	98	18 ± 6 ¹
1,200+ to -1,200	142	124	18 ± 6
-1,200 to -1,200	179	138	41 ± 8

¹The probable error of the difference.

Table 6. Changes in the birth rates (1929-1930 to 1931-1932) of women in families classified according to income history 1929-1932. (Rates adjusted for age, nativity, and 1929 occupation of head of family.)

Birth Rate and Income Change. A population such as the one now under observation, of which a large proportion has suffered severe sudden economic losses, offers a good opportunity to investigate the theory that practices of family limitation are indulged in by the upper section of working class families to maintain their standards of living.⁷ With data for such a population, it is possible to discover whether or not the birth rate of families which met economic reverses declined more in the period in which these reverses took place than did the birth rates of other families.⁸ Table 6 compares the difference between the average annual birth rates for 1929-1930 and 1931-1932 in three income history classes. (See Figure 2.) In all families the average annual birth rate⁹ for 1931-1932 was lower than it had been for 1929-1930; but the birth rate in families with \$1,200 or more in 1929 and less than \$1,200 in 1932 declined no more than the birth rate in other families with incomes of \$1,200 or

⁷It will be assumed that fertility differentials are more largely social than biological, since special studies of this question tend toward this conclusion.

⁸The mere fact of a decline in the birth rate of families with incomes which dropped would be of little significance in view of the general decline in the birth rate throughout the country.

⁹These birth rates have been adjusted for age, nativity, and occupation.

more in 1929. In both of these groups of families the decline was no more than three times its probable error; however, in families with incomes of less than \$1,200 in 1929, the decrease in the birth rate was more than twice as large as in the other two income classes, and exceeded five times its probable error.

Analysis of the birth rates according to a more detailed income history is shown in Table 7. The greatest decline in birth rate between 1929-1930

and 1931-1932 is exhibited by two groups whose income status did not change during the period, that is, the groups whose incomes were \$2,000 and over and under \$1,200, respectively, during the four years. This decline was greater than that exhibited by any of the groups whose incomes dropped during the period. While many of the individual class differences in birth rates between 1929-1930 and 1931-1932 as shown in Table 7 are not significant, considered as a whole the data afford no evidence that families with diminishing incomes attempt to maintain their accustomed standard of living by drastic reductions in birth rate.

The Fertility of the Relief Population. A corollary to the theory that curtailment of the birth rate contributes to the prosperity of a group of families has been the old *laissez-faire* philosophy of social welfare, because of the belief that such expedients as granting relief lower the living standards of the whole population through removing the incentive to family limitation. Exponents of this theory are wont to cite the high birth rate of the relief population as proving the case. We shall now consider the pertinence of their evidence.

The relief population has a materially higher birth rate than the

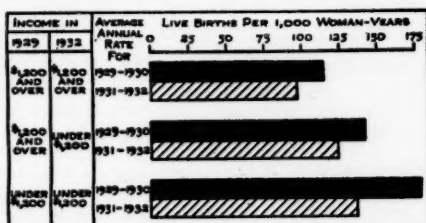


Fig. 2. Average annual birth rates, 1929-1930 and 1931-1932, in families classified according to income in 1929 and 1932. (Rates adjusted for age, occupation, and nativity.)

INCOME HISTORY		BIRTH RATE		DIFFERENCE
1919	1932	1929-1930	1931-1932	
\$2,000+	\$2,000	130	85	45± 12 ¹
2,000+	1,200-\$1,999	108	106	2± 10
2,000+	-1,200	122	101	21± 8
1,100-\$1,999	1,200- 1,999	109	107	2± 9
1,100- 1,999	-1,200	146	130	16± 6
-1,100	-1,200	180	138	42± 8

¹The probable error.

Table 7. Changes in the birth rates 1929-1930 to 1931-1932 of women in families classified according to detailed income history, 1929-1932. (Rates adjusted for age, nativity, and 1929 occupation of head of family.)

nonrelief population, even when the rates are made specific for nativity, income, and occupation (Table 8). The relief birth rate is much higher than the nonrelief in every category. For all classes, the relief birth rate is slightly more than one and one-half times as high as the nonrelief birthrate.

The relief-nonrelief fertility differential shown in Table 8 is not

Table 8. Average annual birth rates (1929-1932) among women in families with incomes of less than \$1,200 in 1932, classified by nativity, relief status in 1932, and 1929 occupation of the head of household. (Rates all classes adjusted for nativity and occupation as well as for age.)

OCCUPATION	ALL NATIVITIES			NATIVE-NATIVE			OTHERS		
	Total	Non-relief	Relief	Total	Non-relief	Relief	Total	Non-relief	Relief
BIRTH RATES									
ALL OCCUPATIONS	143	121	191	144	114	198	145	128	184
White Collar	123	110	180	110	91	186	139	130	174
Skilled	142	118	184	143	119	180	140	116	188
Unskilled	174	141	217	185	142	238	162	140	193
WOMAN-YEARS OBSERVED									
ALL OCCUPATIONS	11,466	7,677	3,789	4,912	3,191	1,721	6,554	4,486	2,068
White Collar	1,653	1,327	316	822	654	168	831	673	158
Skilled	7,307	4,858	2,449	3,322	2,101	1,221	3,985	2,757	1,228
Unskilled	2,506	1,492	1,014	768	436	332	1,738	1,056	682

a product of the relief experience however as can be seen from Table 9. In 1929 when less than 5 per cent of the 1932 relief women were receiving relief, the difference in birth rate between those who were

YEAR FIRST RECEIVED RELIEF	1929	1930	1931	1932
	BIRTH RATES			
1929	293	317	137	117
1930	274	198	252	183
1931	204	187	232	176
1932	203	152	172	162
No Relief Received	129	138	107	108
	WOMAN-YEARS OBSERVED			
1929	52	51	46	45
1930	139	137	135	133
1931	315	310	306	299
1932	553	534	523	509
No Relief Received	1,933	1,871	1,814	1,761

Table 9. Annual birth rates among families with incomes of less than \$1,200 a year, according to their relief history.

than others; and families in which there are many children or in which there were recent births must have had a higher birth rate in any given prior period than those in which there are few children. (It is also likely that the 1932 relief population continued to have a higher birth rate after 1932 since it was composed of families which had had a high birth rate in the past.) That the occurrence of the birth itself may be the cause which reduces the family to relief status is the probable significance of Table 10 and Figure 3 which shows that the average annual birth rate of the relief population declined less from 1929-1930 to 1931-1932 than did that of the non-relief population, since we know that more than four-fifths of the relief population received no relief prior to 1931.

SUMMARY

The findings of the Health and Depression Study relate only

¹⁰ This point was made in Sydenstricker, Edgar and Perrott, G. St. J.: *Sickness, Unemployment and Differential Fertility*. The Milbank Memorial Fund *Quarterly*, April, 1934, xii, No. 2, pp. 126-133.

and were not receiving relief in 1932 (230 compared with 129) was even greater than the difference shown in Table 8 for the four-year depression period.

The high birth rate of the relief population is quite probably due to the manner in which families are selected for relief.¹⁰

Large families and those with recent births are more likely to need relief

to the white, urban working class population, and may be summarized as follows:

1. The fertility differentials¹¹ observed when families are classified according to their incomes in times of more normal business activity are found to a modified degree when families are classified according to their incomes in 1932 after four years of severe economic depression had passed. That is, birth rates, generally, are lower in the higher income

classes, and among the white-collar occupations. Rates among native women of native parentage are not appreciably different from rates among other women. Differentials according to 1932 income are most clear cut between families with incomes of \$1,200 or more

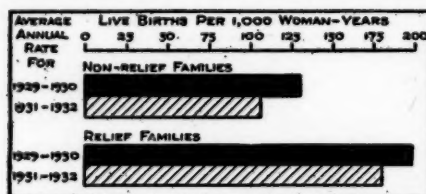


Fig. 3. Average annual birth rate, 1929-1930 and 1931-1932, in families with incomes of less than \$1,200 in 1932, according to relief status in that year. (Rates adjusted for age, occupation, and nativity.)

were the basis of classification.

2. The birth rate¹² of those who were in moderate circumstances in 1929 but who had become poor by 1932 is midway between the

RELIEF STATUS, 1932	1929-1930	1931-1932
Relief Nonrelief	BIRTH RATES	
	199 131	181 107
Relief Nonrelief	WOMAN-YEARS OBSERVED	
	1,940 3,963	1,849 3,714

Table 10. Average annual birth rates, 1929-1930 and 1931-1932, among families with incomes of less than \$1,200 per year, according to relief status. (Rates adjusted for age, nativity, and occupation.)

and those with incomes of under \$1,200. Further subdivision of the group with incomes of \$1,200 or more did not produce additional fertility differentials when 1932 incomes were considered although it did when 1929 incomes

¹¹ The birth rates to which reference is made are average annual birth rates, 1929-1932, unless there is an express statement to the contrary.

birth rate of those who were already poor in 1929 and the birth rate of those who continued in moderate circumstances in 1932. The decline in the birth rate from 1929-1930 to 1931-1932 was about the same in both groups of families in moderate circumstances in 1929, and was most pronounced among families which were poor both in 1929 and 1932. These facts led to the conclusion that these families did not regulate their birth rates in accordance with their immediate economic circumstances. Family limitation is probably a social custom rather than an economic expedient.

3. The average birth rate (1929-1932) among families on relief in 1932 is much higher than that in nonrelief families even when the comparison is limited to poor families. However, the relief-nonrelief differential is still greater if the birth rates for the year 1929 only are compared, when only 5 per cent of the relief families had begun to receive relief. It is safe, therefore, to conclude that the receipt of relief had not stimulated propagation up to 1932. Instead it should be considered that families with a high birth rate are much more likely to need relief than other families, because (1) they already have more children to support than other families, and (2) the occurrence of the birth itself may be the precipitating cause which renders an otherwise self-supporting family dependent.

ANNOTATIONS

EPIDEMIOLOGY AND THE CONTROL OF SYPHILIS

EPIDEMIOLOGY plays an increasingly important part not only in directing the control measures used against infectious disease but also in locating cases and foci of infection. The relationship to control in the former instance is not easily defined except in general terms. Studies of prevalence from reported cases or surveys tell the extent of the problem and indicate the directions along which preventive effort should be applied, while further studies check the efficacy of preventive methods. This relationship of epidemiology to control is broad, and sometimes, it must be confessed, remote. The other—that of bringing to light cases and infective foci—has been dubbed by its proponents “practical” epidemiology. Because of the limitations of space, rather than because of the sobriquet, it is proposed to limit the present discussion to this latter phase of the subject.

Syphilis spreads, as a rule, directly from person to person so that the epidemiologist does not need to worry about carriers and intermediate hosts. The basic problem is therefore to find cases. The identification of cases of syphilis has been approached, as recently pointed out by Smith,¹ from two different angles: the first being the routine performance of serological tests. While it seems unlikely that the present serological tests can ever be used for the whole population, Smith reiterates the statement that certain groups can and should be tested routinely. The most important group is perhaps the relatively large one composed of admissions to hospitals, clinics, and other institutions, where immediate clinical as well as ultimate preventive aims may be served. A less frequently mentioned but no less important group is made up of those serving sentence, particularly for vagrancy and sex delinquency,² in penal institutions. This tech-

¹Smith, Dudley C.: Practical Epidemiology of Syphilis. *Journal of the American Medical Association*, September 5, 1936, cvii, No. 10, pp. 784-786.

²Among 1,790 such persons convicted in New York City in 1934, 774, or 43.2 per cent, were found to have syphilis.

nique of case-finding among various groups is one which, properly directed, should have much value in bringing cases under treatment.

Smith lists another and more essentially epidemiological approach to the detection of cases which it is proposed to discuss at greater length: the study of the contacts of a presenting case with a view to finding both the source of infection for that case and the individuals who in turn may have been exposed and infected by the presenting case. Such a procedure has long been an accepted one in tuberculosis case-finding but only recently does one begin to find favorable comment upon its results in this country when applied to syphilis. Munson, an early exponent of the method, has suggested that the omission could be attributed to a mistaken sense of "delicacy." It seems more likely that most workers in syphilis control considered it improbable that patients could be induced to name sexual partners. However this may be, Munson³ reported several epidemics in small communities worked out in great detail as to sources and directions of spread by his technique of "sole leather epidemiology." A second report⁴ the following year added other epidemics and outlined further techniques of obtaining information about the spread of both syphilis and gonorrhea. These classic reports were vigorous as well as informative, and outlined procedures which could not but have value in case-finding in rural areas and small communities.

In cities where individual relationships may be both complex and obscure it was thought that Munson's direct approach might be impractical. However, not a little evidence has accumulated to prove the value of at least part of the technique of direct approach even here. There were undoubtedly many clinics where an attempt was made, with greater or less success, to question the patient about contacts. Very little, however, appeared in the literature on the results obtained. In 1930, shortly before the appearance of the work of Munson just cited, Leland, Nelson and Gorman⁵ published a study from the City Clinic in Lowell, Massachusetts, showing the directions in which clinic service was improved when a trained social worker was added to the staff. Important among these for present purposes was the large number of contacts brought under ex-

³Munson, W. L.: Practicability of Epidemiological Methods in the Control of Syphilis. *American Journal of Public Health*, February, 1932, xxii, No. 2, pp. 134-140.

⁴Munson, W. L.: Epidemiology of Syphilis and Gonorrhea. *American Journal of Public Health*, August, 1933, xxiii, No. 8, pp. 797-807.

⁵Leland, H. L.; Nelson, N. A.; and Gorman, A. I.: Does Follow-Up Social Service Pay in a Venereal Disease Clinic? *New England Journal of Medicine*, December 11, 1930, cciii, No. 24, pp. 1200-1204.

amination. It was emphasized that the only approach made was through the patient himself.

Beside the Lowell Clinic there are a number of other urban clinics from which data have been made available. Among these are the University Clinic at Charlottesville, Virginia, reported by Brumfield and Smith,⁶ the University Hospital Clinic in Philadelphia, reported by Ingraham,⁷ and the Mt. Sinai Hospital Clinic in New York City from which a personal communication was received through the courtesy of Dr. George Baehr.

Taking the reports of these clinics and comparing them insofar as they are comparable, certain facts stand out. The first is that where new admissions to the clinic, irrespective of the stage of their infection, are questioned as to their original and subsequent contacts, a good response is obtained. On the average, one available (local) contact is unearthed for every case. The proportion of contacts who are willing to submit to examination is in the neighborhood of 80 or 90 per cent. The majority undergo examination at the same clinic. The proportion of contacts found infected tends, however, to be relatively low—approximately 20 per cent.

Where clinics confine case-finding only to new admissions which show evidence of being in the early and infectious stages of syphilis, a fairly large proportion of refusals to name contacts are encountered (from 20 to 50 per cent, depending upon a number of factors often beyond the control of the worker in this field) but a rather high proportion of contacts per cooperative case is disclosed. Where white persons are named as contacts, from 60 to 90 per cent are willing to submit to examination. Colored persons commonly show somewhat, but not markedly, lower percentages.

These are very encouraging facts, but the figure which provides the most important argument for the provision of services for contact follow-up of early and infectious urban clinic cases is that of the proportion of examined contacts found to be infected. Smith and Brumfield⁸ have shown that this figure may be as high as 80 per cent. This high proportion indicates a very careful selection of contacts.

It has already been stated that the literature on this method of case-

⁶Brumfield, W. A., Jr. and Smith, D. C.: Transmission Sequence of Syphilis. *American Journal of Public Health*, June, 1934, xxiv, No. 6, pp. 577-580.

⁷Ingraham, Louise B.: The Persuasive Approach with the Infectious Syphilis Carrier: A Study in Public Health Method. *Journal of the American Medical Association*, December 12, 1936, cvii, No. 24, pp. 1990-1995.

⁸Smith, D. C. and Brumfield, W. A., Jr.: Tracing the Transmission of Syphilis. *Journal of the American Medical Association*, December 16, 1933, civ, No. 25, pp. 1955-1957.

finding is far less than the accumulated experience with the procedure should warrant. There is definite need of reports from various clinics where it is being tried, not only upon the results obtained but upon the methods of approach found most effective and the difficulties encountered.

The contribution of Ingraham⁷ takes up in some detail the technique of approaching infectious cases for information as to contacts. It stresses persuasion, as against compulsion, and an appeal adapted to the patient from whom the information is needed. It further emphasizes the importance of cooperation between the clinic physician and the worker in this field, the former preparing the patient for interview with the latter. An important observation is that only 41 per cent of patients give satisfactory information as to contacts when this is sought on the first day of clinic attendance but that 62 per cent may be induced to discuss contacts after a better acquaintance with the interviewer. It is, of course, important that skilled and considerate handling of the patient in other subdivisions of the clinic greatly simplify the interviewer's problem. The article further deals with the locating of contacts through the efforts of the patient himself or of the social worker and the persuading of contacts to undergo examination.

The review of what has been accomplished along the lines of contact follow-up has so far been confined to what has been done in city clinics. This is a very important aspect of the problem for a large proportion of syphilis cases are treated in clinics. A definite percentage is, however, treated privately, and this percentage is undoubtedly larger in rural areas. Some attempt has therefore been made to assist the private practitioner in this direction. A health department field worker was provided by Nelson⁸ primarily for the follow-up of patients reported by practitioners as lapsing treatment. Success was also achieved in securing the examination of contacts and the treatment of those found infected. Somewhat similar facilities are now being offered to practitioners in New York State but it is too early as yet to learn the results of the procedure. The problem is somewhat simplified by the fact that the greater part of the cases privately treated are under the care of relatively few practitioners.

Of the two techniques of case-finding—serological testing of groups and contact follow-up—the second is undoubtedly the more fundamental. The development of new and more generally applicable diagnostic tests may change the picture somewhat but the testing and periodic re-

⁷Nelson, N. A.: Follow-Up in General Practice. *New England Journal of Medicine*, June 1, 1933, ccviii, pp. 1153-1157.

testing of really extensive population groups will always be difficult in the extreme.

The emphasis given the epidemiological aspects should not be interpreted as implying that they are the sole factors in controlling syphilis. The search for cases will find more popular support if there is a better general understanding of the issues at stake and the discovery of cases is, of course, meaningless if adequate treatment for them cannot be provided. The procedure, therefore, has to be coordinated with public health education and the provision of good clinical facilities for adequate diagnosis and treatment. Where this has been done it can be seen that real progress has been made.

RALPH E. WHEELER, M.D.

• • •

TUBERCULOSIS AMONG NATIVE RACES

VARIOUS studies of tuberculosis among Indians in the United States have indicated a relatively high prevalence of infection and an exceedingly high mortality from the disease. A recent survey of the Alleghany Reservation Indians in Cattaraugus County, the native race in that area, is of considerable interest because the findings among them are compared with those for a group of white persons living in the same general area.¹

Korns states that the 972 Reservation Indians consist of half-breeds or those with less than half Indian blood. Since the Indians are enrolled according to the old custom of following the lineage of the mother, there are no records by which the proportion of Indian blood may be determined accurately. They mingle with the white population outside of the Reservation in high school, at movies, and in domestic or other work.

Two-thirds of the 972 Indians were given an examination consisting of a partial physical, an X-ray of the chest, and the Mantoux tuberculin test with 0.1 mg. of Old Tuberculin. It was believed that those examined were from a health standpoint representative of the Reservation as a whole. The prevalence of tuberculous infection among Indians was found to be considerably higher at each age than the rates noted for a random sample of the white rural families of Cattaraugus County. It

¹Korns, J. H.: Comparative Tuberculosis Findings Among Indians and White Persons in Cattaraugus County, New York. *The American Review of Tuberculosis*, October 1936, xxxiv, No. 4, pp. 550-560.

appears that infection is acquired at an earlier age among the Indians than among the white persons tested. The calculated incidence of infection among Indians reaches its peak (19.7 per cent) at ages 5-9, with a secondary peak at ages 40-49; on the other hand, in the white population the incidence of infection rises slowly and is acquired more frequently in young adult life (ages 20-29) and declines throughout later adult life.

The rate of active cases of tuberculosis found among the Indians was 6.1 per 1,000 population, or about five times the rate of known active cases among white persons for the entire County. The ratio of Indian tuberculosis mortality to that among white persons was six to one.

Among the 625 Indians X-rayed, 9.8 per cent showed evidence of lesions of primary infection. Korn's states, "These Indians show a rather surprising amount of tissue resistance to tuberculosis as judged by their X-ray films. Their resistance appears to compare favorably with that of the white persons" surveyed in the County. "Possibly the large admixture of white blood in these Indians and their exposure as a group for many generations to tuberculosis account for this relatively high resistance."

Another study of interest is an investigation of tuberculosis among the Maori, a native race of New Zealand, made by the Department of Health of New Zealand in conjunction with the Medical Research Council of Great Britain.² Slightly more than 2,000 Maoris (the entire population of Waiapu County) living in a rural area of the East Coast District were surveyed. This population group was considered as generally typical of the Maori of New Zealand.

Every Maori home within the area chosen was visited and all individuals were investigated for the presence or absence of tuberculosis. The investigation consisted of a thorough inquiry into the family history and the possibilities of contact, a careful clinical examination, and the Mantoux tuberculin test. All positive reactors to the tuberculin test were X-rayed, and also those negative reactors who, at clinical examination, showed suspicious signs. The period of the investigation covered one year.

Fifty-three active cases of pulmonary tuberculosis were noted and 30 cases of arrested disease; 11 active cases of nonpulmonary tuberculosis and 21 arrested cases were found among the 2,022 persons examined. The

²Turbott, H. B.: Tuberculosis in the Maori, East Coast, New Zealand. Government Report, Department of Health, New Zealand. 1935.

active case rate among the Maori was 31 per 1,000 population during the period of investigation.

Primary pulmonary lesions were noted in 3.06 per cent of 914 Maori X-rayed; tracheo-bronchial calcification was reported 27 times; and enlarged hilum shadow, without calcification, was noted in 6 individuals.

Turbott states that "Regarding type of lesion, childhood or adult, no dogmatic statement is made. From this investigation it seems as if the adult Maori is not being overwhelmed by the childhood acute first infection type of lesion as in primitive unprotected races, such as Jamaicans, reported upon by Opie,² but is going through the costly process of building up relative immunity."

The mortality from all forms of tuberculosis among the Maori was found to be approximately nine times that among Europeans in New Zealand with a rate of 49.4 compared with 4.5 per 10,000 population.

The immunological findings among the Maori were similar to those among the Indians in Cattaraugus County. Approximately 49 per cent of the 2,022 Maori had a positive reaction to the Mantoux tuberculin test. Infection was acquired more frequently in the early ages and young adult life than in later life. Among the Maori contact was found to be a serious factor, especially in children up to 15 years of age.

Both of these studies of native races indicate a high morbidity and mortality from tuberculosis among them. However, the fact that both the Indians and the Maori show some resistance to tuberculosis—neither race seems to be overwhelmed by the acute first infection type of lesion—is of considerable interest because of its bearing upon the prospect of control of the disease among them.

JEAN DOWNES

• • •

REPORT ON MATERNAL MORBIDITY AND MORTALITY IN SCOTLAND¹

WITH the publication of this report another detailed analysis of carefully studied cases is added to a rapidly growing literature directed

¹Opie, Eugene L.: Epidemiology of Tuberculosis of Negroes. *Bulletin of the International Union Against Tuberculosis*, July, 1931, viii, No. 3.

²Douglas, Charlotte A., M.D., D.P.H., M.C.O.G., and McKinlay, Peter L., M.D., D.P.H.: Report on Maternal Morbidity and Mortality in Scotland.

toward the prevention of death and sickness associated with childbirth. Data for the report cover nearly all of the maternal deaths in Scotland for a period of a little less than three years; in all, conditions surrounding 2,527 deaths were reviewed. The analysis followed those lines which have become almost routine for recent studies on maternal mortality. Details of antenatal, intranatal, and postnatal care; the effects of age, parity, and home conditions; birth attendants; previous health status; period of gestation; complications of pregnancy and labor; and a good many other factors, are evaluated primarily for purposes of allocating cause and responsibility for death. The conclusion—that well over 50 per cent of puerperal deaths are preventable—follows the detailed review of these cases as it has followed almost every other maternal study. Recommendations for earlier and more continuous prenatal care, for making available better facilities in complicated cases, for the restriction of manipulation and instrumental interference, for the protection of the puerperal woman from dangers of infection, for closer organization of those responsible for obstetric care, all of these, and more, follow as almost obvious results.

One part of the study differs significantly and importantly from other surveys dealing with maternal health; namely, that it includes a somewhat similar survey of pregnant women who did not die. Information for this aspect of the more general public health problem was obtained from the analysis of over 39,000 schedules representing nearly all of the births in Scotland during a six-months period ending in June, 1932. Age of the mother, previous parity, and rooms per person furnish the basic headings under which abnormalities of mother, complications of pregnancy, and complications of labor are tabulated. These tabulations furnish useful but not altogether satisfactory information. The well-recognized deficiency of such data for a representative group of births is discussed and it is pointed out that the collection of records from physicians and midwives presents great difficulties. In many cases the attendant at birth keeps no record and for a large number of cases only very incomplete data are submitted. The selection of cases which result from the failure to obtain complete data adds to the difficulties of interpretation. However, if the inclusion of this material does no more than to focus attention on its importance, a valuable end will be gained.

No copy or reproduction of the schedule on which the original records were made is included in the report and, in line with this omission, com-

plete statements of the details of the analysis are not given. This will doubtless appear as a serious omission to critical readers and to those who will wish to use the report for reference and as an aid in planning further studies.

CARROLL E. PALMER, M.D.

• • •

NUTRITION PROBLEMS IN A RELIEF POPULATION

SPECIAL diets were supplied for one or more individuals in more than 10 per cent of the 170,593 families carried by The Family Service Division of the New York City Emergency Relief Bureau on April 1, 1936, according to a report by Sue E. Sadow,¹ supervisor of the Home Economics Department of The Family Service Division. Diet therapy had been prescribed for over 28,000 persons under medical care. Of these, Miss Sadow states: "nearly 25 per cent were suffering from malnutrition, 10 per cent from anemia, over 7 per cent from tuberculosis, over 6 per cent from diabetes, nearly 5 per cent from gastric ulcer, and the balance from a variety of conditions including respiratory, gastro-intestinal, cardiac, cancer, kidney diseases, and so on. The cost to the City of New York for the additional requirements necessitated by these therapeutic diets was over \$103,000 a month." These figures, says Miss Sadow, give "cause for thought" and she very pertinently asks "What do we know about the state of physical health of other members of these families? Do we not need to be more concerned with the total health situation in the family?"

Little is known of the nutritional status of the large population dependent on relief or of that other large population forced during these years of depression to manage on extremely small earnings. On the basis of a special examination of 514 school children in a poor neighborhood of New York City in June, 1933, physicians rated the nutritional status as "good" for 38 per cent of the children in families with a weekly income of \$6.00 or more per person; for 19 per cent of those in families with less than \$4.00; for 23 per cent of those in families on home relief; and for only 8 per cent of the children in families on work relief.² Thus at the

¹Sadow, Sue E.: The Problems of Therapeutic Diets in a Public Relief Agency. *The Family*, October, 1936, xvii, No. 6, pp. 204-209.

²Kiser, Clyde V. and Stix, Regine K.: Nutrition and the Depression. *The Milbank Memorial Fund Quarterly*, October, 1933, xi, No. 4, pp. 299-307.

time this special study was made, the children in relief families cared for by the Home Relief Bureau appeared to be better off than those in other low-income families, especially those on other types of relief. The special nutrition service for the Emergency Relief Bureau was begun in September, 1933, and the conditions reported by Miss Sadow are those existing after two and one-half years' operation of a plan for providing for the special diet needs of families on home relief. Information concerning adequate diets at minimum cost has been widely distributed by both social and health workers, but it is doubtful that those who need to be most careful in their food expenditures can work out their diet problems without individual advice.

When a therapeutic diet is involved, or even a special formula for infant feeding, Miss Sadow points out that the cooperation of the physician or hospital clinic, the medical social worker, and the relief agency, in addition to the nutritionist may be required to solve the family problems. Miss Sadow says:

The therapeutic diets prescribed were generally expensive, and it immediately became the duty of the nutritionists to make substitutions of cheaper foods without changing the fundamentals of the diet. In spite of the need for strictest economy, this was done in each case only after consultation with the physician who gave the original prescription. . . .

The ordering of expensive therapeutic diets by physicians is tied up with the unfamiliarity on their part with food costs, cheap substitutes capable of bringing about the same results, and the economic limitations of clinic patients in carrying out their recommendations. The patient looks upon the therapeutic diet as medication—as the one thing which will bring about his cure. If expensive foods are included in the diet, one of two things happens: (1) realizing that he is unable because of lack of funds to buy these fancy foods, many of which he has never eaten before in his life, the patient becomes discouraged and does not adhere to his diet at all, thus retarding his own recovery; or (2) at no matter what sacrifice to other members of the family, he insists upon having the exact foods listed given him, thus plunging the family into further financial chaos.

These indicate problems which are just as real to the family existing on a minimum income as they are to the relief family. Out-patient departments, private physicians, and the Baby Health Stations are giving more attention to providing low-cost diet lists or formulas, according to Miss

Sadow, than formerly, but much still needs to be done with the problem of interpreting diets to the housewife and mother who must keep food expenses to an absolute minimum.

Prevention of nutritional deficiencies obviously should be the aim of both health and social workers. It is not easy to change the diet habits of a population, and the experience of those seeking to teach the low-income family the essentials of adequate dietaries has been that educational material must be supplemented for many families with individual advice on the selection of their food supply.

DOROTHY G. WIEHL